

# THE IRON AGE

New York, June 25, 1925

ESTABLISHED 1855

VOL. 115, No. 26

## Steel the Metal for Sports

Rapidly Replacing Wood in Many Outdoor  
Games and Sports with Excellent  
Success



STEEL is doing the impossible—or what was considered impossible but a few years ago. It is taking the place of willowy, resilient woods in the manufacture of many sporting goods. The steel golf club is no longer a novelty, for the "whip" of a nicely balanced steel shaft is said to be quite equal to that of well-seasoned hickory. For many years the steel fishing rod has registered increasing gains over its split bamboo brother in the craft of Izaak Walton.

Babe Ruth has not yet swung a steel bat against a curving horsehide—and yet the possibility of steel bats for baseball is not so remote as might have seemed the case four years ago. Hockey sticks are still made of wood,

but if the news from Dayton, Ohio, is any criterion, we may see steel sticks upon the rinks at some not-too-distant time. For out at Dayton they

are making a steel tennis racket—steel frame and steel gut—which is in the nature of an epoch-making event in the world of sport.

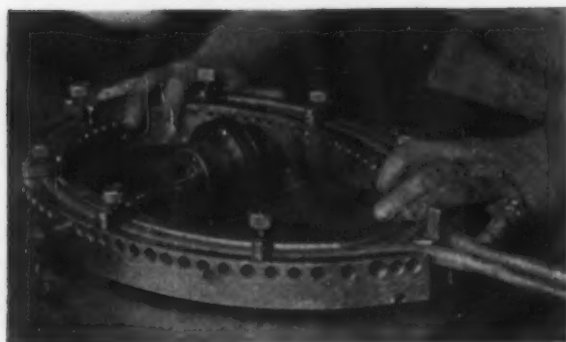
When the steel racket was first discussed, nearly everyone recognized that it would be a great thing, if it worked. The problem was, could a steel racket be made which would give to the sensitive player that indescribable and vital combination of balance, resiliency and liveliness known as "feel"?

The answer, after four years of constant experimentation, refinement and improvement, is that it can. And in that answer lies the possibility of an ever widening use of steel for other sporting appliances in which wood is now the only available material. If steel can be used to replace the delicately balanced and springy wooden frame as well as the taut and lively animal gut used in the best tennis rackets, its limitations in the field of sport are few indeed.

The advantages which are inherent in the use of steel for tennis rackets are obvious. A steel racket is not subject to those annoying effects of temperature and climate which affect a wooden frame. It will not



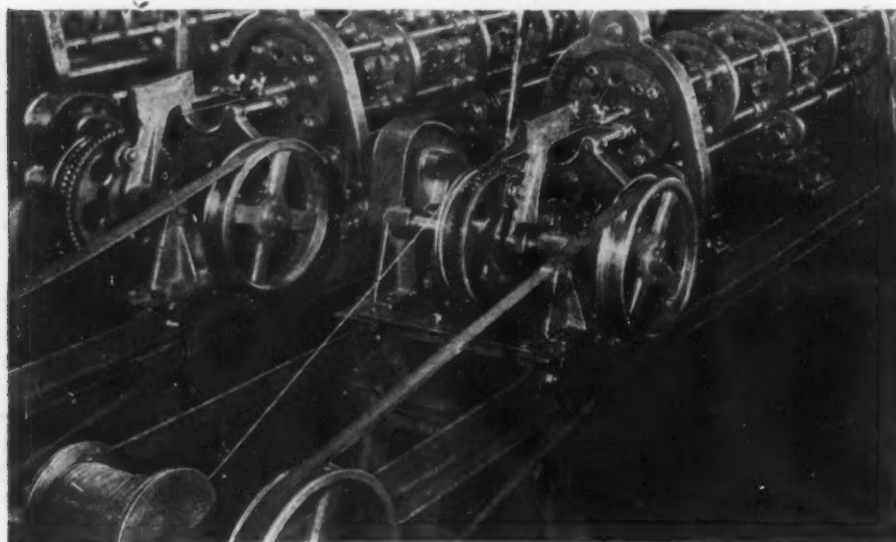
Dayton Steel Rackets in Final Stages of Construction. Adjusting the balance with scales and weights



*Drilling the Holes in the Frame*

warp. Its strings do not break under the influence of moisture. It cannot come unglued, for there is no glue used in its construction.

Then, too, steel rackets can be made and sold at a lower price than wooden rackets of corresponding quality. As suitable woods become more and more scarce this margin of economy will probably increase.



*Machines for Making the Special Hollow-Core Wire Strings That Give the Real "Live" Resiliency of Animal Gut*

Finally, steel is stronger. It has been called "unbreakable," but of course it is not that. Being twice as strong as a wooden racket (by actual laboratory tests) it is, however, practically unbreakable from the player's standpoint. Many a vital match has been lost because of a "kill" or a smash close to the net, resulting in a fracture of the wooden throat of a racket made familiar through long use. The change of rackets during a close match is very likely to throw a player "off his stroke" and the match is lost. With a steel racket, the chance of such an occurrence is extremely rare.

Again, the first cost is the last cost with a steel racket. Wooden rackets need constant restringing. Steel stringing lasts as long as the frame itself. When it is remembered that a single restringing costs at least five or six dollars, and that many rackets are restrung two or three times a season, the savings are readily seen.

Then, too, the steel racket permits of playing tennis at the seashore or in localities where the constant humidity makes it almost impossible to keep a wooden racket properly strung. In the tropics the steel racket is an absolute necessity for those who play the game.

The steel racket is made entirely of steel, with the exception of the grip, which is of the usual wooden construction. Like the wooden racket it has an oval frame, but this frame is of high quality steel tubing. It is strung with a newly perfected specially stranded steel wire which has a hollow core and a resiliency equal to the best gut. This steel stringing is stranded

from the finest gage steel wire and the hollow core is formed by the withdrawal of the foundation wire upon which the stranding is done.

The frame is made of the best seamless steel tubing, drawn to a 7/16 in. outside diameter, having a wall thickness with a tolerance of variation of only 0.002 in. The carbon content is given by H. W. Norton, chief engineer of the Dayton Steel Racket Co., which controls the patents on the manufacturing processes, as 0.25 to 0.35 per cent and the nickel content at 3.5 per cent, this being the formula known as S. A. E. 2330. It is made by piercing a 3½ in. billet and giving the resulting tubing four hot passes, each over a mandrel.

After pointing and pickling, it then undergoes seventeen cold drawing operations, between each of which an annealing and pickling operation is necessary. The tubing is then cut to suitable lengths and retort annealed. The actual fabrication of the racket begins when the tubing is bent into the oval racket shape, the ends of each piece being brought together and straightened out in two parallel extensions to take the handle. The next step is to span the throat with the bridge, which is brazed into the opening, completing the oval.

The frame and extensions then form one solid piece of steel without seam or break.

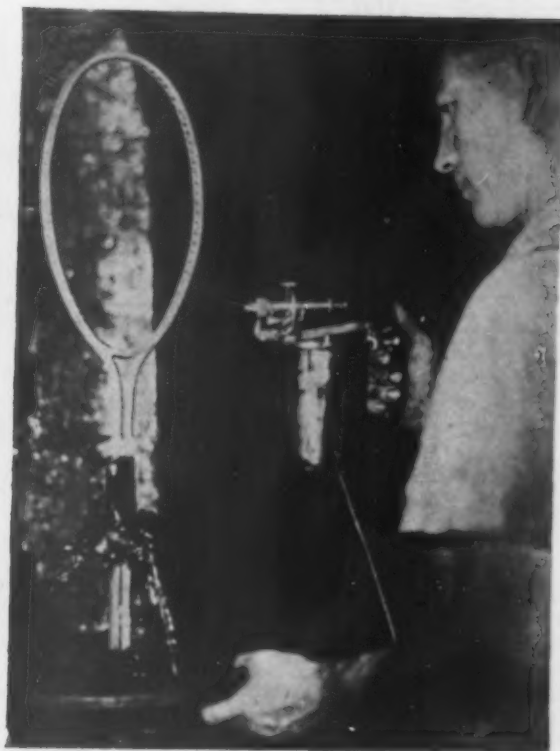
The drilling of the holes for stringing is performed on a specially designed machine which makes each hole at exactly the right point. After removing the burrs left by this drilling, the holes are sized and the rough edges turned inward. When this is done the frame goes to a machine which forms a groove along the upper and outer side to a point halfway down the sides of the oval. This channel protects the stringing where it passes through the holes to the exterior of the frame. The frame is next hardened by heating to 1450 deg. Fahr., and cooled in a specially designed oil-cooled die, which prevents distortion while cooling.



*Brazing the Throat Piece to the Frame*



*Half The Weights Used in This Test Broke a Wooden Frame at the Throat. The steel bent, but did not break under twice the stress*



*Applying the Enamel (or Duco) Finish with Air Brush. The enamel is baked in at 300 Deg. Fahr.*

The metal handle ferrule is next attached to the frame extensions. This is a small cup-shaped cap into which the head of the handle is later fitted. It is soldered to the steel tubing and the whole is then given sand-blast treatment, removing oil and dust. The frame is now ready for finishing, either by spraying on a black enamel and baking or by using the Duco finish now used for motor-car bodies. After the wooden handle is cemented in place, a rivet holds it firmly in position.

The elastic wire stringing is strung in the same manner as ordinary animal gut, using the same tools. The stringing is coated with a chemical rust preventive which dries transparent in a thin but tenacious film which is very durable. The racket is finally tested for

balance, any discrepancy being corrected by the addition of two small leads inserted in holes bored in the butt of the handle. When these have been plugged in securely, the leather heel plate is bound around with a leather heel strip, as in the ordinary wooden racket.

The steel rackets are manufactured in sufficient quantity today to permit their sale at a price approximately one-third less than that of a wooden racket of equal quality. The Dayton steel racket is the invention of William A. Larned, seven times national champion and one of the best known figures in the tennis world. The company was incorporated in 1922 and manufacture has been continuous since that time, with constant experimentation and improvement accompanying regular production.

### American Exports of Alloy Steel Bars

WASHINGTON, June 23.—A report has been issued by the iron and steel division of the Department of Commerce on the exports of alloy steel bars from the United States in 1923-1924, and for the first four months of 1925. Total exports in 1924 were 2742 gross tons valued at \$614,912, or an average of \$224.26 per ton. This compares with exports in 1923 of 2148 tons valued at \$769,649, or an average of \$358.31 per ton. For the first four months of this year these exports have amounted to 1504 tons, valued at \$227,711, or an average of \$151.40 per ton. At this rate the exports for the present year will run as high as 4500 tons, or the largest for the three years under consideration.

The report shows that these bars go to a large number of countries, many of them taking only very small amounts. The leading market, however, has been in Canada, which in 1924 took 1786 tons, or about 65 per cent of the total. In 1923 Canada was also the largest buyer, absorbing 878 tons, with Cuba second at 544 tons. For the first four months of this year Canada has taken 1296 tons, or about 86 per cent of the total.

### Large Automobile Production in May

May production of automobiles is reported by the Department of Commerce at 382,714 passenger cars and 43,303 trucks. Both figures are lower than those for April, but are much higher than those for May, 1924, with 286,324 passenger cars and 35,314 trucks. Except for April, with 391,302, the number of passenger cars reported for May is the largest for any month on record. In trucks, while the total is large, it has been exceeded on several occasions.

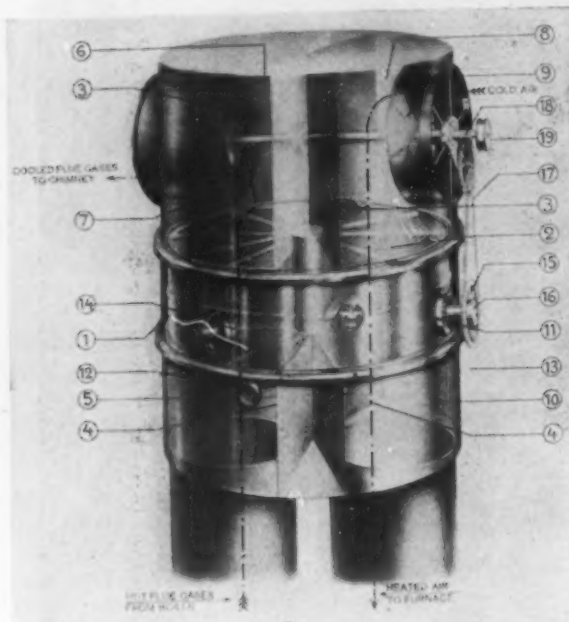
For the first five months of the year production of passenger cars has been 1,571,891, compared with 1,627,058 in the five months last year and with 1,526,601 in the five months of 1923. In no other year did the first five months reach 1,000,000 cars. The current year, therefore, is the second highest in our history and is higher than that for 1923—a year in which the 12-month total showed the greatest number of cars ever produced.

In trucks, the five months of 1925 provide the highest production on record, with 198,773 against 164,205 last year, 166,246 in 1923 and 93,080 in 1922.





Above is the Casing in Which the Rotor Revolves. It shows the two vertical passages, with air-lock between. At right is a phantom of the entire apparatus



## BOILER AIR PRE-HEATING

Advantages Include Reduced Fuel Consumption and Ability to Use Lower Grade Fuels

BY STEPHEN C. MILLER\*

REVIVAL in the use of pre-heated air for modern boilers and its threat to oust the economizer may be attributed to (1) rising cost of fuel; (2) tendency to operate boilers at higher ratings and to increase boiler pressures for high efficiency in turbine practice; (3) heat recovery from flue gases when feed water is heated through the full economic range by steam bled from the prime mover; (4) improvements in design of pre-heaters.

Many improvements in boiler practice have conspired to permit the safe forcing of the boiler to high rates of evaporation, which necessarily cause higher temperatures of the leaving gases. This gives an opening for the pre-heater, by the source of heat recovery presented. If full advantage be taken of the theoretical gains obtainable by stage bleeding, a further heat exchange from the flue gases to the feed water becomes impracticable, because of the close approach to the saturation temperature of the steam.

Recovery of the waste heat by pre-heating the combustion air seems the logical scheme to which to turn. Until recently all attempts to exchange heat from boiler flue gases to combustion air were by means of apparatus which necessitated the passage of heat through the material separating the two. Failure to achieve the high degree of economy aimed at in the development of his turbine locomotive led Frederic Ljungström, a Swedish engineer, to depart radically from existing practice in pre-heater design. His invention is claimed capable of attaining the full measure of heat recovery desired for economical operation.

Carrying heat continually in a mechanical way from the flue gases to the combustion air, this apparatus forms a simple, self-contained, compact device easily applicable to new or existing boilers. As shown by the shadow illustration, the hot flue gases pass up the left side, penetrating through minute passages between plain steel plates and crimped steel plates laid in alternating layers in the rotating member (1). The casings above (6 and 8) and below (5 and 10) the rotor are divided, as shown in the other illustration, into a semi-circular space and a segment, for flue gas and air, separated by blind portions which act as an air-lock.

Cold air passes down the right side of the phantom illustration, passing through the rotor in the direction opposite to that traversed by the hot gases and through the self-same minute passages heated up by the flue gas.

In thus effecting a heat exchange, by heating the air and cooling the flue gas, 70 per cent or more of the waste heat in the flue gas is recoverable. A pair of fans on a single shaft operates to draw in the cold air for furnace use at one end, while forcing out the cooled flue gases to the chimney at the other.

### Efficiency Test

In an efficiency test of Lancashire boilers, comparison was made in efficiency of the boiler under conditions with and without the economizer and with and without the air pre-heater. Without either economizer or pre-heater the boiler reached a maximum efficiency of 62 per cent on an evaporation of 7500 lb. of water per hr. With the economizer, but without the pre-heater, the maximum efficiency was about 67 per cent, at about the same quantity of evaporation. With the pre-heater, but without the economizer, the efficiency at this rate of 7500 lb. per hr. was 75 per cent. This was not the maximum, however, for the efficiency continued to increase with increasing evaporation until it reached 79 per cent at about 12,500 lb. per hr.

## The Revolution in Ore and Coal Handling on the Great Lakes

Alexander C. Brown, president Brown Hoisting Machinery Co., Cleveland, prepared the text which accompanies a pictorial history of ore and coal handling on the Great Lakes in an article taking five pages of a recent issue of *Trade Winds*, published by the Union Trust Co., Cleveland. The pictures show the development of the mechanical loading of coal and unloading of ore at lake ports, going back to the days previous to 1880 when ore was hoisted by donkey engines out of the hold of the boat in barrels or tubs, dumped into wheelbarrows and moved back to the dock by hand on board walks supported by wooden trestles. The picture story and the text tell graphically of the great contribution of the late A. E. Brown to the revolution in the bulk traffic of the Lakes in the decade following the discovery of the Mesabi iron range.

Total apparent consumption of babbitt metal, based on reports received by the Department of Commerce from 25 firms, was 5,097,825 lb. in April, compared with 5,619,309 lb. in March, 5,137,030 lb. in February and 5,631,111 lb. in January.

\*Vice-president James Howden & Co. of America, Inc., Wellsville, N. Y. This brief abstract is taken from a paper read before the Rochester, N. Y., Engineering Societies.



# Physical Chemistry in Steel Making

## Reactions of the Basic Electric Process of Steel Making Discussed—Five Fields of Study Suggested

LONDON, ENGLAND, June 11.—When the mining and metallurgical congress was held in London last year attention was directed to the lack of accurate knowledge of the physical chemistry of steel-making processes. It was then decided to appoint a committee to arrange for further discussion of the important problems involved, and the meeting held this week under the joint auspices of the Iron and Steel Institute and the Faraday Society was the outcome of steps taken by the committee.

Sir Robert Hadfield, who occupied the chair, opened the proceedings with an address in the course of which he showed that the great developments of Bessemer, Siemens, Gilchrist, and Thomas were based on a reasoned structure of chemical and physical science, and not mere chance discoveries. The electric furnace, which has been developed in an unobtrusive manner during the last two decades, promises to prove as potent as Siemens's regenerative furnace, since it is a mechanism which can be controlled and is capable of producing highly refined steel.

Further during this time there has arisen what may almost be described as a new age in metallurgy, that of the alloy steel, and its rapid strides have been no doubt in a measure due to many series of systematic researches and the better understanding of a domain of science that is governed by the laws of physical chemistry. This new field of progress is so important, because of the remarkable properties obtained, and by the development of the use of alloy steels the engineer has been provided with material permitting progress as to design and utility, hitherto undreamed of. In the manufacture of these steels new problems become opened up for the steel maker and a much more complicated set of reactions takes place than with ordinary carbon steels.

To such an extent has advance been made in the study of the rationale of the free energy of chemical reactions, and the significance of the equilibrium con-

stant, that there are now definite means known for attacking, from a purely theoretical basis, the fundamental reactions in question. But Sir Robert Hadfield pointed out one serious disability to the successful prosecution of the task, and that is a lack of the essential physical data at high temperatures, specific heats, heats of reaction and equilibrium constants, the determination of which involve difficult and extensive experiment requiring a high order of skill. It is to the pure scientist that the steel maker must look for the determination of these needed constants.

### Suggested Subjects for Study

The future development of all classes of steel-making processes must depend in some measure upon refractory material research, since the present temperature limits are governed by the properties of the materials used in the furnace structure. The same limits must also influence the possible use of oxygen, which has been shown, on purely theoretical grounds, to have certain advantages. These subjects alone are fields representing great possibilities in the future, but in addition Sir Robert Hadfield enumerated other problems, of which the following are the more important:

- (a) Study of the equilibria of slag reactions, which are the key to reactions in the steel;
  - (b) Mechanism of the origin of slag inclusions in steel, and means for their elimination;
  - (c) Reactions between molten metals and the refractory materials constituting the hearths and banks of furnaces, and the conditions of penetration of combined and "adsorbed" oxides;
  - (d) Study of the physical properties of slag at high temperatures, viscosity, fluidity, surface tension;
  - (e) Study of the mode of the cooling of ingots, which would throw light on the problem of segregation, and the physical properties of the segregates.
- Further development of the work on the equilibria of the oxides  $\text{SiO}_2$ ,  $\text{CaO}$ ,  $\text{MgO}$ ,  $\text{Al}_2\text{O}_3$ , and the reducible oxides  $\text{FeO}$ ,  $\text{MnO}$ , undertaken originally by the Geophysical Laboratory of Washington for geological purposes, would be of value in furthering the study of the subjects referred to in paragraphs (a), (b), (c) above.

## Chemical Reactions of the Basic Electric Process

FRANK T. SISCO, metallurgist, Air Service, War Department, United States Army, Dayton, Ohio, read a paper under the above heading. In the basic electric process the scrap is melted under oxidizing conditions that may be closely controlled. By regulating the amount of oxide used with the charge or added after melting is complete, all of the silicon is oxidized and is held by the slag and a variable amount of manganese and carbon are oxidized. The former goes into the slag, the latter passes off as carbon monoxide gas.

Control of these two elements depends upon the amount of oxide used, the character and composition of the scrap, and to a great measure on the skill of the furnaceman. By carefully controlling oxidation and regulating the temperature, most of the phosphorus is oxidized to phosphoric acid and is held by the slag as calcium phosphate. After oxidation is completed the slag is removed and the metal recarbonized, if necessary or advisable. Recarbonization with some form of carbon serves to eliminate dissolved ferrous oxide, but in its place introduces carbon monoxide gas and possibly suspended inclusions from the ash in the recarbonizer.

### Deoxidizing and Desulphurizing

The final period of the process consists of deoxidizing and desulphurizing the metal by means of a very

basic slag containing an excess of carbon or calcium carbide. When deoxidation is thorough, complete desulphurization follows. With little or no excess carbon or calcium carbide in the slag, it is possible to desulphurize to some extent, but very little deoxidation will take place. Desulphurization is most efficient when the slag is highly basic, fluid and hot and when calcium carbide is present.

Deoxidation by calcium carbide first takes place in the slag. When the slag is nearly free from ferrous and manganese oxides, deoxidation of the metal occurs at the plane of contact between metal and slag, through migration of  $\text{FeO}$  and  $\text{MnO}$  from metal to slag to restore the disturbed equilibrium. Deoxidation is accelerated by changing the metal at the plane of contact, by stirring or through convection currents. A small amount of  $\text{FeO}$  and  $\text{MnO}$  escaping reaction with calcium carbide will be reduced to ferrosilicon.

Fluorspar is used to confer fluidity upon the slag and accomplishes this with but little sacrifice of basicity. The fluidity is the result of the presence in the slag of fluorides and silicofluorides. Fluorine is very active and exercises a corrosive effect upon the furnace refractories. It also increases the silica content of the slag with slightly reduced basicity. This increase in acids in the slag is not so great as is the case when silica sand is used in place of fluorspar.

## FORGING DEFECTS

### Clinks One of Greatest Dangers—Heat Treatment Basic for Good Results

"A FULL understanding of the nature of defects in large forgings, and their reference to operating stresses, should be understood by operating and designing engineers. It is this neglect to realize the limitations of large forgings which has caused them, through failures, to fall into disrepute; while in reality they are one of the most uniform materials of construction."

These opinions were voiced by J. Fletcher Harper, research engineer, Allis-Chalmers Mfg. Co., Milwaukee, in a substantial contribution to the machine shop session of the spring meeting of the American Society of Mechanical Engineers, held at the Hotel Pfister, Milwaukee, May 18 to 21. The title of Mr. Harper's paper was "Defects in Large Forgings."

The statement often made, that the materials of today are not as good as they were formerly was denied by Mr. Harper, who said that they are infinitely better. The masses used, the speeds of operation and the temperatures and pressures now found in apparatus were not, he said, even considered a few years ago, and it is this new order of things which calls for greater uniformity and homogeneity of materials.

Defects in forgings were classified as (1) those inherent in the material, and (2) those caused by the method of production. The common defects in the material or the ingot from which the forging is made were given as variation in composition; piping and gas pockets; cracks; and slag lines and "ghost lines." Variation in composition, if not excessive, was said to be of no great importance. It was stressed, however, that any practice in which two heats of steel are utilized without the employment of a large mixing ladle, or in which two ladles of steel are poured without the use of a common runner box, should be frowned upon.

Slag lines or ghost lines were defined as streaks varying in composition from the major portion of the metal and usually containing slag impurities. They usually show up in the machined surface of a forging as light or dark marks. The material in these lines differs in composition from the rest of the steel, being usually very low in carbon and high in phosphorus. These lines differ in hardness from the surrounding material, which causes the tool to jump in machining and the lines to show. The danger from these lines is a much debated question. It was stated that it could be safely said that in straight tension, the strength of the material containing the lines differs little, if at all, from that of the adjacent material containing no lines. However, the action under reversed stress is another matter, and that under temperature changes appears to be detrimental. Being of radically different composition, the expansion and contraction are different from that of the surrounding material. It was stated that because of these two unknown variables, reversed stresses and temperature variations, that ghost lines are prohibited in high-class equipment.

#### Clinks Increase with Size of Work

Defects due to production were listed as laps; star cracks; clinks; improper reduction; and heat treatment. Star cracks are formed in the center of a shaft and are not usually seen unless the shaft is bored. A common cause of this type of failure is forging after insufficient heating, working the hot outer portion over the cold center and causing it to fracture. Forging of a large section on too small a hammer or press, or forging it down round instead of square as far as possible and then rounding it up, were said also to produce these defects.

Clinks were characterized as one of the greatest possible dangers in the making of large forgings. In the casting of large ingots or even small ingots of alloy steels, enormous stresses are set up in cooling. If this cooling is permitted to extend below about 1000 deg.

Fahr. without being equalized, these stresses usually reach such a point as to cause rupture. It was said to be considered good practice not to permit a large ingot, or a forging from it, to cool completely until it has been heated uniformly to above the critical temperature of the material. On reheating an ingot, the rate of heating until the center portion has passed 1000 deg. Fahr. should be very slow; otherwise the expansion of the outer portion will cause a clink. The reheating of a forging which is partially forged, and the equalizing of the temperature of the finished forgings, were stressed as demanding great care and experience if this class of defect is to be eliminated. The occurrence of clinks increases with the size of the work and the use of the denser alloy steels.

Relating to proper heat treatment several major points of caution were dealt with and several precautions taken by the Allis-Chalmers company to secure good large forgings were enumerated. The heating and cooling, it was said, should be uniform and applied to the entire mass, eliminating any possibility of local heating or cooling of any part. In large forgings the effect of mass must be considered, and time allowed for the complete penetration of the heat. It should be appreciated that there is a certain amount of inertia present which resists structural changes, and that the larger the mass, the greater will be the length of time necessary to accomplish any change. Any heat treatment that obtains high physical strengths but leaves the material in a highly stressed condition should be avoided. A uniform distribution of the microscopic constituents in as fine a size as possible should be had, in order to prevent cleavage planes of weakness.

### Brass Goods Manufacturers Meet

The National Association of Brass Manufacturers concluded a successful summer meeting at the Edgewater Beach Hotel, Chicago, on Thursday afternoon, June 11. It adopted a color scheme, whereby all hot water faucets of indexed type will, in the future, be wrapped in red paper which will indicate "hot water," while the cold water faucets will be wrapped in a lighter color, yellow or light gray paper, the advantage being obvious. It avoids unpacking or unwrapping the goods to ascertain which is hot and which is cold, and in many cases not properly recovering or rewrapping, with the result that the goods become dingy.

A resolution reaffirming the freight allowance of 200 lb. to the jobber was favorably acted on.

Chairman Ottke of the catalogue committee stated that a complete outline of the catalogue with illustrations would be presented at the next meeting of the Association.

The next meeting will be held in Cleveland, on Sept. 9 and 10.

The Baltimore Valve Corporation, Baltimore, represented by its vice-president, Julian H. Marshall, and the Roberts Brass Mfg. Co., Detroit, represented by Earl William Roberts, were elected to membership. Among the guests that were present were: J. L. Mott Iron Works, Milwaukee Flush Valve Co., Street & Kent Mfg. Co., Union Brass & Metal Co., Capitol Brass Works, Baltimore Valve Corporation, Roberts Brass Mfg. Co.

### Steel Treaters in Los Angeles

Edgar E. Jameson, president of the Jameson Steel Co. of San Francisco, was the principal speaker at the monthly meeting of the Los Angeles Chapter, American Society for Steel Treating, held Wednesday evening, June 10, in the Westinghouse Building, Los Angeles. He spoke on "Alloy Steels Used in Die Work and for Cutting Tools," bringing out the need of heat treatment in the preparation of steels for use in the Pacific Coast territory on account of this section being so far from the source of supply. C. A. Stiles, superintendent of the Lacy Mfg. Co., and chairman of the chapter, led the discussion.



## MAGNETIC TESTING

### Applied to Discover Hidden Defects in Turbine Wheels—The Apparatus

The death of Dr. C. W. Burrows, announced in THE IRON AGE May 7 together with an outline of some of his activities in the issue of May 14, makes a description of one of his accomplishments of timely interest.

It was Dr. Burrows who assisted in the development, at the request of the General Electric Co., of a method of magnetic analysis of bucket wheels for turbines manufactured by that company. While connected with the Bureau of Standards, he had devoted extensive study to the connection between magnetic reactions in steel and its physical characteristics.

Owing to the speeds at which turbines are run, it is essential that the bucket wheels be sound and of uniform characteristics throughout. While General Electric engineers were confident that the existing methods of inspection were efficient, nevertheless it was the feeling that no method, so long as it functioned efficiently, could be overlooked. As a final check, therefore, on the integrity of the wheels in question, J. A. Capp, engineer of the testing laboratory at Schenectady, suggested the method of magnetic analysis. Accordingly, Dr. Burrows was retained by the company to apply it.

The apparatus used consists of two main parts, (1) a chuck mounted on a vertical spindle which is rotated

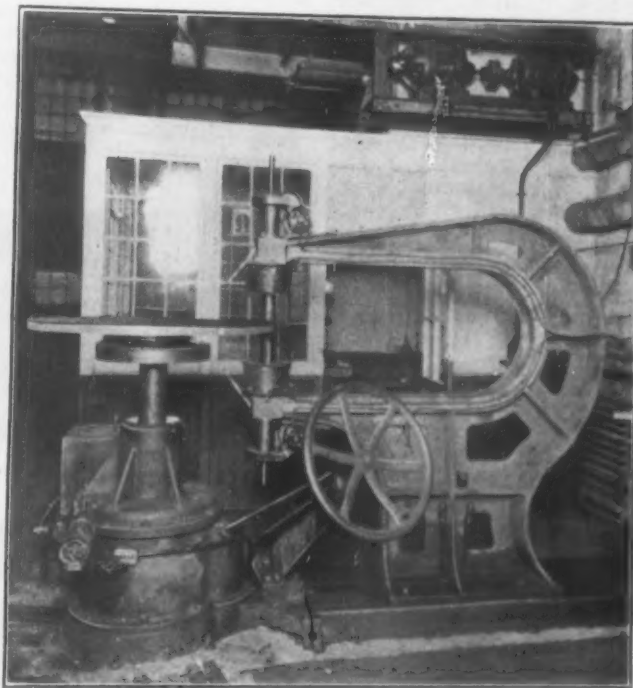
by a motor and carries the bucket wheel to be tested, and (2) a C-type casting or yoke in the jaws of which are mounted vertically adjustable pole pieces, between which the bucket wheel passes while turning. Solenoids, coils connected to a galvanometer, a mirror and photographic recording apparatus, are the chief other component parts of the equipment.

With the finished wheel in the chuck and rotating slowly between the pole pieces, the magnetic circuit

consists of the yoke, poles, air gaps between poles and wheel, and the wheel itself. It may readily be seen that any variation in the density of the wheel, such as a crack or other flaw, would cause a change in the magnetic permeability of the circuit, which, in turn, would be reflected to the recording apparatus.

Wheels are not tested until in the finished state. Should such a wheel show a defect by this test, it is set aside for investigation. It is possible that the defect is so localized that it may be removed completely by locating a steam balancing hole at that point. Should the defect cover a larger area, the wheel is cut up for a study of the defect.

It is high tribute to the character of the steel employed and the methods of manufacture followed that, out of approximately 2400 forged wheels tested, only a dozen were set aside for further investigation as a result of this test. The General Electric Co., however, is convinced that the apparatus enables its engineers to obtain a simple and effective final test analysis. That it does so without damaging the material is a most valuable asset.



*Testing a High-Speed Turbine Bucket Wheel Between the Poles of the Burrows Magnetic Machine*

### Forging Cast Steel

Recently a forging test was made to demonstrate the quality of the cast steel used by the Industrial Works, Bay City, Mich. That company operates its own foundry for the production of steel castings for its cranes, and has always maintained that the cast carbon steel which goes into the making of its products shall meet the following minimum physical requirements when tested in the "as cast" or unannealed condition: Tensile strength, 60,000 lb. per sq. in.; yield point, 30,000 lb. per sq. in.; elongation in 2 in., 15 per cent and reduction of area, 18 per cent.

A slab shaped like a billet 4 in. by 7 in. by 30 in. long was cast from regular carbon steel, with a chemical composition of C, 0.18; Mn, 0.83; Si, 0.324; P, 0.03 and S, 0.040 per cent. "As cast" without any heat treatment or annealing it had the following physical properties: Tensile strength, 68,000 lb. per sq. in.; yield point, 35,000 lb. per sq. in.; elongation in 2 in., 25 per cent and reduction of area 34.1 per cent. After annealing it had a tensile strength of 68,800 lb. per sq. in.; a yield point of 35,800 lb. per sq. in.; an elongation in 2 in. of 31.5 per cent and a reduction of area of 51 per cent.

This slab was forged under the steam hammer into two connecting rods  $2\frac{1}{2}$  in. x  $\frac{3}{4}$  in. x 20 in. The metal

forged without any sign of cracking or tearing. A test specimen,  $1\frac{1}{2}$  in. sq. by 20 in. long, was forged from the end of the piece and, without any heat treatment or annealing, a test bar from it gave the following physical properties: Tensile strength, 76,250 lb. per sq. in.; yield point, 56,500 lb. per sq. in.; elongation in 2 in., 25.5 per cent and reduction of area, 43.4 per cent.

A bend test, made from this forged test bar 1 in. x  $\frac{3}{4}$  in., bent by repeated blows with a sledge flat on itself without any sign of cracking.

The Pittsburgh Electric Furnace Corporation has taken over the sales and service of the Edmoore demand limiter. This device has been perfected and placed on the market for limiting total plant loads through the elimination of peak loads, with the object of cutting down the consumer's power bill by giving him a better load factor at a lower demand. It is pointed out that, from the power company's point of view, the device is of interest as it limits the demand for any one plant and absolutely eliminates the possibilities of running up peak loads as may happen. The device is applicable to almost any type of load, including electric melting furnaces, electric heating furnaces, motors, etc.



## METAL FOR MINE CARS

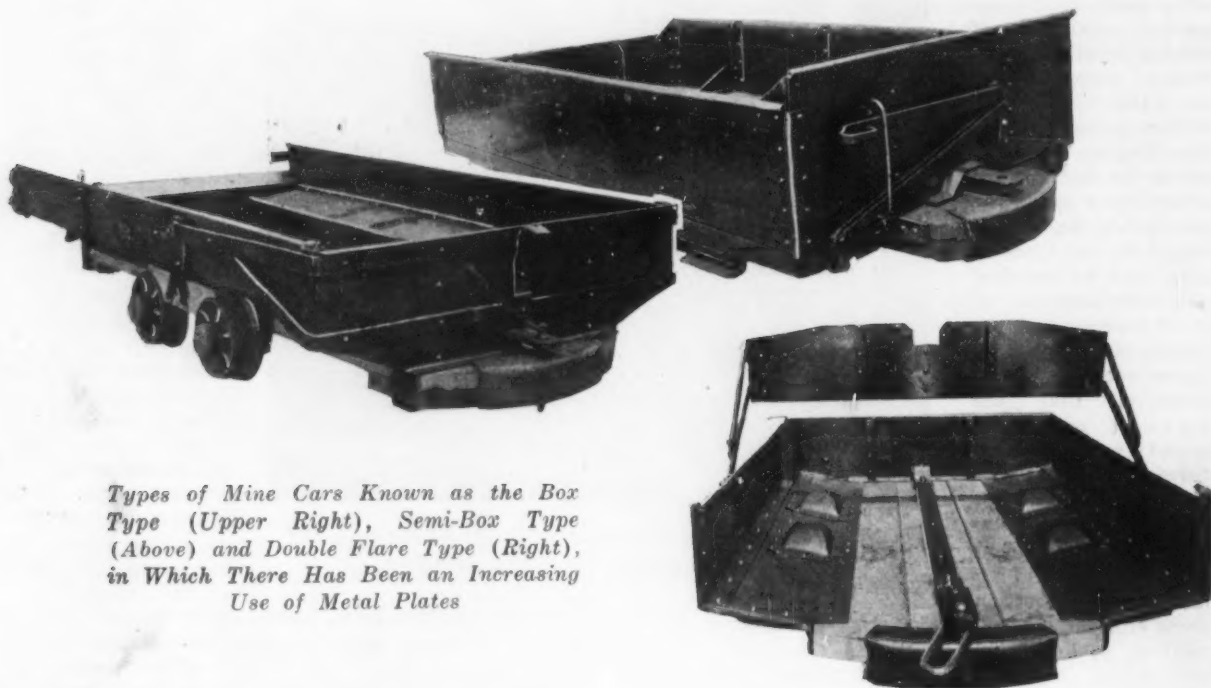
### Plates of Special Analysis Rust-Resisting Material Partly Replacing Wood

RECENT changes in the design of mine cars have brought about a marked increase in the use of metal plates in the place of wooden planks for flares, sides and ends, according to C. P. Daniel, vice-president and general manager of the Enterprise Wheel & Car Corporation, Bristol, Conn., which specializes in this type of car manufacture.

Ten or twelve years ago there was a temporary turning to the use of metal plates instead of planks, but designers erred in using plates too thin to stand

Not only has the thickness of the plates been increased to insure long life and continued strength but the character and quality of the metal itself has come in for its share of investigation. The greatest enemy of steel, oxidation, is particularly a problem in coal mining as the prevalence of sulphur and mine water is the cause of rapid corrosion. Cars have recently been built in which special analysis material of rust-resisting qualities has been used; and while the first cost of such material is higher, the additional life and strength of the cars are counted on to justify its continued use.

The increasing use of composite cars will be justified, it is stated, only if costs of mining are reduced. The most important phase of coal mining operations, aside from labor, is transportation. In the present



*Types of Mine Cars Known as the Box Type (Upper Right), Semi-Box Type (Above) and Double Flare Type (Right), in Which There Has Been an Increasing Use of Metal Plates*

rough usage and corrosion and as a result the cars soon became battered or rusted. Then, too, the cars were built of all metal, including the bottoms which were braced and riveted, making a car too rigid to keep well to uneven mine tracks. Thus wrecks and derailments were charged to the metal car. After such experiences many coal operators lost interest in metal cars.

However, profiting by the former failures of metal cars engineers are now specifying heavier plates,  $\frac{1}{4}$  in. and  $\frac{5}{8}$  in. thick, with ample strength to resist rough mine usage. Also, most metal cars now have a wooden floor which supplies the necessary elasticity to enable all four wheels to stay on even the temporary track laid in the mine rooms and at the mining face.

battle for lower costs per ton, which is really a battle for existence with many coal mining companies, engineers and executives have turned their attention to mining transportation and one phase of this problem is the use of metal in mine cars, this taking its place along with layout, grade and condition of track, car hauls, feeders, dumps, weight and efficiency of mine locomotives, etc.

The first mine car of record was a straight side box set between the wheels like a boy's express wagon. Then the style changed to what is known as the single-flare type; more lately the double-flare type, the box type and the semi-box type have come into use. It is in these three modern types that the use of metal plates has increased.

### Fall Meeting of American Electrochemists

The fall meeting of the American Electrochemical Society will be held at Chattanooga, Tenn., Sept. 24 to 26. The society's headquarters for the meeting will be at the Signal Mountain Hotel, a 40-minute ride from the heart of the city.

The principal symposium for the meeting will be on "Relation of Electrochemistry to the Fertilizer Industry." Dr. H. C. Parmelee, editor *Chemical and Metallurgical Engineering*, New York, is in charge of the symposium, which will embrace papers on nitrates, phosphates, hydrogen, potash and other allied subjects. On Saturday, the last day of the meeting, a trip to Muscle Shoals has been arranged, including an inspection of the Wilson dam.

### Bookings of Steel Castings Lower

WASHINGTON, June 22.—Steel castings booked in May totaled 49,619 tons, or 49.4 per cent of shop capacity, based on reports received by the Department of Commerce from principal manufacturers, representing more than two-thirds of the commercial castings capacity of the United States. The May total compares with 59,008 tons or 58.8 per cent booked in April. Of the May bookings, 16,055 tons, or 37.3 per cent of capacity, were for railroad specialties and 33,564 tons, or 58.5 per cent of capacity, were miscellaneous castings.

For five months the total was 312,592 tons, against 349,978 tons last year. Railroad specialties, with 127,870 tons against 176,039 tons, more than accounted for the drop. There was a gain in miscellaneous castings, from 173,939 tons to 184,722 tons.

# Surface Cracks in Rolling Steel

## Nine Varieties Originating in Ingots—Causes of Snakes and How to Combat Them— Effect of Quality of Steel

BY HENRY D. HIBBARD\*

**T**HIS article is the outcome of the study of a kind of crack, familiarly described as "snakes," sometimes met with in rolling steel ingots. In the endeavor to plainly differentiate between these and the other cracks which may occur or appear in steel ingots when first hot-worked, it was necessary to deal with such other cracks so fully that the scope of the paper expanded as announced in the title. The hot-working in which these cracks appear may be given the ingot by grooved or straight rolls in a blooming, slabbing or universal mill.

### Nine Varieties of Cracks

A crack or tear which shows in an ingot either before or during breaking down, may usually be distinguished as one of 9 classes or kinds which either are, or are due to:

1. Snake.
2. Cold shut.
3. Tear from hanging in the mold.
4. Too rapid heating of cold ingot.
5. Redshortness.
6. Burning or overheating.
7. Dendrites.
8. Skinholes.
9. Tears in parts which are stretched without work.

These will be considered in succession. With the possible exception of No. 4, they might perhaps all be comprehended by the old English term "roak" or "roke," which was the name generally given to a surface defect in a steel bar, whatever its cause.

### 1. Snakes

A snake is a certain kind of crack which sometimes exists in a steel ingot and is opened or made visible by hot-working. It may be a single crack or have branches, and may extend irregularly a quarter or even half way across a side of the ingot. It is a hair crack and usually difficult to find or see in the cold ingot if present; it does not as a rule extend inward to any great depth, usually less than half an inch. When the ingot is hot-worked, however, any snake in it is spread open by the stretching or extending of the adjacent parts so as to show plainly.

A snake may occur in any steel either killed, partly killed, or effervescing. It is usually called a snake, but in some shops the name "butt-crack" is applied to it because of its location near the bottom of the ingot. The name snake was originally applied as descriptive of and suggested by the defect caused by a natal crack in a slag ingot which, when the ingot was rolled into a plate at one operation, showed on its surface. The crack itself may have been almost or even quite obliterated by the spreading and smoothing effect of the rolls, but scale would cling to the metal quite noticeably along the line of the crack which ran in a crooked wavy way suggestive of the reptile named. The term also covers cracks of this sort in square ingots rolled into blooms and billets in which they are stretched out as the piece is elongated so as sometimes not to be readily distinguished in the bloom from other cracks, due to other causes as noted later.

Snakes appear only in the first rolling of an ingot and in its product, that is, in bloom, slab or plate. A second heating and rolling usually works them out unless they are exceptionally large. They are due to two direct causes, one or both: First, a chemical or

metallurgical cause, namely, incipient hot-shortness and, second, a physical cause, ferrostatic pressure of the liquid metal.

A snake if present is almost always in the lower part of the ingot because the pressure of the column of molten steel, which is the usual direct cause, is greatest there. There may be one or several on a side and those present are usually near the centers of the flat sides away from the corners.

### Genesis of a Snake

The genesis of a snake is somewhat as follows: Assuming the casting temperature to be correct within allowable limits, the metal, as teeming proceeds, begins almost immediately to freeze against the cold mold surface so that a solid shell is formed inclosing the still molten interior. At first, as at the completion of teeming, the shell is weak, the metal being somewhat mushy and supported everywhere by the mold. The latter is heated within continuously by the molten metal and consequently expands while the solidified shell being cooled tends to contract. Being pressed against the mold by the weight of metal above which it is too weak to withstand the shell must be stretched by the expanding mold. When the quality of the steel is good enough, or the distance small enough, it will endure this small stretch without breaking and no cracks or snakes will be formed. But if the steel has any considerable hot-short tendency or if the size of the mold and hence of its surfaces is large enough, the shell may be pulled apart and one or more snakes result.

Prevention of snakes lies, therefore, first, in making good steel and then in casting it under proper conditions. To give steel the quality which best resists the snaking tendency it must not only have reasonably low sulphur content but must also be well cleaned of oxides, particularly those of iron, manganese and silicon which tend to make red-short, as well as hot-short, any steels which contain them. These matters have been dealt with elsewhere and need only be mentioned here. The boil of the bath at the end must be gentle when the steel is to be killed and brisk for steels intended to effervesce.

### How to Combat Physical Causes

The physical causes of snakes are to be combatted by casting methods which may be itemized as follows:

1. *Smaller Cross-Section of Ingot:* This gives smaller mold surfaces which condition favors freedom from snakes. Solidification is hastened and the freezing shell is longer in contact with the mold, because of diminished expansion of the latter, and hence stronger than when the ingot is thicker, which enables it to more effectually resist the pressure.

The extreme instance of this is the crucible steel ingot, cast by hand, only 4 in. by 4 in. or sometimes less in cross-section. In Sweden 20-ton heats of high carbon acid steel for the tension members of flying machines are top-cast in molds 10 in. sq. and the steel is free from snakes, though not wholly because of small cross-section, as the quality is right and paragraph 3 mentioned below is also observed.

2. *Shorter Ingots:* The ferrostatic pressure is thereby lessened, and the snaking tendency consequently diminished as already explained. This

\*Consulting engineer, Plainfield, N. J.

(Continued on page 1879)



## One-Half Yard Full Revolving Excavator

A ½-yd. full revolving, gasoline or electric driven excavator, mounted on corduroy traction has been added to the line of the Harnischfeger Corporation, Milwaukee. The new machine, designated as the P & H model 204, is similar to other models offered by the company. It handles a ½-yd. dragline or clamshell bucket on a 30 ft. boom and has a rated lifting capacity of 13,000 lb. at 10 ft. radius, which is 75 per cent of its tipping capacity. The shovel, which is of ½-yd. capacity, is of standard P & H design, with an all-steel box section boom, outside dipper sticks and a crowding motion which permits the full control of the dipper at all points acting independently from the hoisting motion. A 40-hp. gasoline motor is employed, the drums have a standard line speed of 110 ft. per min., and there are two travel speeds, 11/16 and 1¾ miles an hour, forward and reverse.

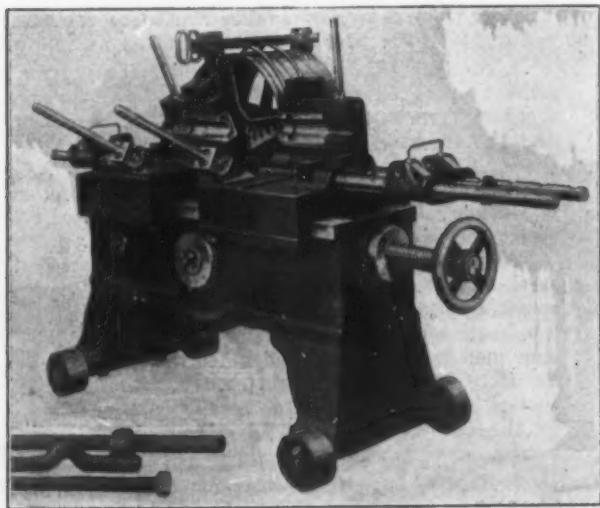
## Head and Collar Forging Press

The pressing of collars and heads of various shapes on spindles, axles, bolts and other parts is the function of the machine here illustrated. Collars may be pressed singly or in multiple on material of any length, and a feature stressed is that multiple collars may be made closely adjacent.

The machine is being marketed by W. Edlich, Delawanna, N. J., but is manufactured by the Paul Auerbach Machine Works, Saalfeld-Saale, Germany. It is intended to obviate the welding of collars as well as turning them down from the solid. Pressing is claimed to improve the fiber of the material, which is held so that straightening is unnecessary after pressing. As the shaping is by pressure, less power is said to be required than if the shaping were accomplished by blows. In addition to making collars and stamping of heads on axles, bolts, screws and rivets, the machine is said to be adapted for bending work.

Three sizes of the machine are available, for material 1.457, 2.087 and 3.346 in. in diameter, respectively, the sizes of heads and collars pressed in round iron in the dies for each size being, ¾ to ¾ in. and ¾ to 2½ in., respectively, in the smaller and larger machines. The maximum length of collar which can be forged is 2.7 times the diameter of the shaft. The production from each machine is claimed to be 120, 100 and 60 pieces an hour.

The drive is by belt. A safety clutch is provided to prevent accident to the machine in case the maximum pressure is exceeded or the material is insufficiently heated. Adjustable stop rods located on both sides of the machine are intended to prevent movement of the material during pressing, serving also for adjustment of the collar length, which in connection with the collar or head length previously adjusted,



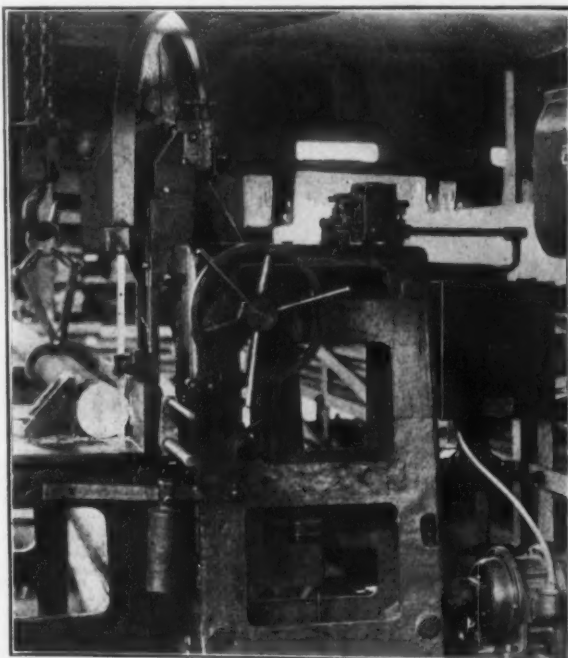
Heads and Collars Are Pressed on Spindles, Axle Bolts and Other Parts. Multiple collars may be made closely adjacent

give the desired collar and head diameter. The length of the stop rods depends upon the length of the material to be pressed. The approximate weights of the machines are 1500, 3600, and 6600 lb., respectively.

## Band Saw Stops at End of Cut

A motor-operated metal cutting band saw which stops automatically at the end of each cut is in operation at the plant of the George F. Blake, Jr., Co., Worcester, Mass. The control equipment for this device is arranged so that the motor is stopped without arcing at the contact tips of the travel-limiting device, a desirable feature in view of the inherently slow action of such a saw. The machine itself was built by the Stockbridge Machine Co., Worcester, and utilizes a ¾ horsepower motor and a magnetic switch, both of General Electric manufacture, and a Trumbull disconnecting switch.

At the end of each cut a cam is tripped, releasing a trigger which gives a blow to the "stop" push-button. This closes the circuit to the switch, throwing off the power supply to the motor. By this arrangement the



At the End of Each Cut, the Band Saw Stops Automatically. Arcing of the contact tips of the travel limiting device has been eliminated

slow motion of the saw itself is not used in pressing the push-button and consequent arcing at the contact tips is avoided.

## New High Record Production of Portland Cement

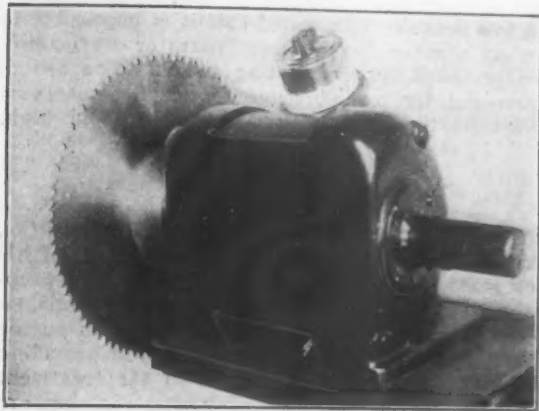
May production of Portland cement was 15,503,000 bbl., according to the United States Geological Survey. This is the greatest production for any month on record, being nearly 3 per cent ahead of the previous record, made last August. Shipments, at 16,735,000 bbl., were the greatest for any May on record, but were exceeded by August, September and October of last year.

Production for the five months of the year is placed at 57,455,000 bbl., a new high record, displacing the 53,249,000 bbl. of last year. Similarly, shipments for the first five months, at 52,585,000 bbl., make a new high record, displacing the 47,460,000 bbl. of last year. Stocks at the end of May are reported at 18,646,000 bbl., a decrease of about 9 per cent from the maximum figure, recorded at the end of March.



### Special Motors for Circular Saws

Three-phase induction motors, with one flat side to permit easier access to the saws with which they



*Induction Motor With One Flat Side for Driving Saw Bench*

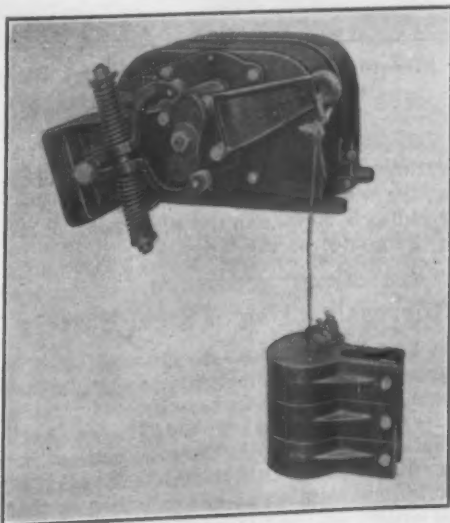
are to be used, have been placed on the market by Forbes & Myers, Worcester.

These motors are similar to those used on the company's tool grinders and are intended for manufacturers and users of saw benches. The motor shown is rated at  $\frac{1}{2}$  hp., 3600 r.p.m., 220-volt three-phase 60-cycle, but similar motors for either two or three-phase current of any voltage up to 550, and from  $\frac{1}{4}$  to 5 hp., are available.

The saw is mounted directly on the motor shaft, no bearings being required except the usual ball bearings of the motor. The saw is close to the motor, so that the action is easier on the bearings than the usual belt. The stator winding differs from that of the usual induction motor in that all wires are omitted from one side, the unbalance being compensated by changing the wires on the opposite side. The rotor is more nearly of the usual kind. It consists of a cast iron core mounting on a steel shaft, and through the core are aluminum bars which are welded together into aluminum rings at each end. There are no insulating materials in the rotating members. The switch can be mounted wherever most convenient for the operator, which is usually at a greater distance from the motor than in the motor illustrated.

### Hoisting Facilitated by Limit Switch

Safer and more positive operation is claimed to be provided by the device illustrated, which has been developed by the Cutler-Hammer Mfg. Co., Milwaukee,



*Upward Travel of the Hook on Electric Cranes Is Controlled Automatically*

for limiting the extent of upward travel of the hook on electric cranes operated by direct-current motors.

When the hoist block reaches the upper limit, it raises a counterbalance weight, permitting a weighted lever to drop and thus trip the contactors. The latter disconnects the motor from the line and connects a resistor in the armature circuit of the motor, which then acts as a self-excited series generator and gives dynamic braking. Quick, accurate stops are said to be obtained because the braking effort is independent of line conditions and of the position of the motor controller, and is proportional to the speed of the motor. Taps are provided on the resistor to adjust the dynamic braking effort in accordance with service conditions.

When the limit switch is in the "tripped" position, a by-pass circuit makes it possible, on reversing the controller, to lower the hoist block out of the limit position, and the counterbalance weight automatically resets the contactors. Manual or rope-operated reset instead of automatic reset may be arranged also.

The switch may be mounted in any one of four different positions, and is available in two sizes. It can also be used with an alternating-current motor, but no braking effect is obtained, and minor changes in the limit switch and the controller are required for lowering the hoist block out of the limit position.

### Drill Speeder for Use on Radial Drills

Shown in the accompanying illustration is the drill speeder recently brought out by the Hoefer Mfg. Co., Freeport, Ill. The device permits the use of large radial drills with their long range, and at the same time pro-



*Heavy Duty Drill Speeder Intended to Save Wear on Radials*

vides proper speeds for drills smaller than can be operated properly on such machines. Saving in the wear and tear of the radial, as well as increased production and lower cost, are advantages claimed for the device.

The speeder consists of a housing of suitable dimensions, with a nose and driver to fit the particular machine on which it is to be used, which assures sufficient range beyond its requirements with a capacity of  $1\frac{1}{4}$  in. Gears of 2 in. face width, with 6-8 pitch stub form of tooth, made integral with spindles, are employed and the gears and spindles are hardened, the latter being ground. Hyatt roller bearings are used on all spindle bearings, and Timken roller bearings to take end thrust. Rigidity is a feature, as is compactness, the device measuring less than 12 in. through its largest cross section. It may be attached or removed quickly.

"Reduction of Zinc Oxide by Carbon" is the title of a technical bulletin of the school of mines and metallurgy of the University of Missouri. The authors are G. A. Zeller and B. M. O'Harra.

## Bridge Type Dipper Front Facilitates Digging Slag

A device intended to facilitate the digging of slag and stripping or digging of coal with power shovels is the Clark bridge type dipper front here illustrated, which has been brought out recently by the American Manganese Steel Co., Chicago Heights, Ill.

Ruggedness is a feature stressed, the bottom of the dipper front having a double wall supported by con-



*The Bottom Has a Double Wall Supported by Connecting Ribs, Which Form Sockets for the Teeth*

necting ribs, which in turn form sockets for teeth. This is claimed to double the strength of the dipper lip. The ribs are arranged so that the front may be equipped with the number of teeth that will dig most efficiently under given circumstances, a 2½-yd. front, for example, permitting the use of either three, four, five or nine teeth. Into the square tooth pockets are placed alternately digging teeth of tool steel and pick-up teeth of cast manganese steel. There is also provided a small renewable wearing band under the teeth, on the outside of the cutting edge.

The number and length of the tool steel digging teeth may be changed conveniently to suit conditions and the absence of bolts or other locking devices facilitates removal of the teeth for resharpening. When the teeth have become worn they may be brought forward by placing small blocks in the bottoms of the sockets which hold the teeth. These plates in the sockets are always in the same plane which provides even distribution of shock and wear over all the teeth.

The front is flat, as shown, the flat bottom being reinforced to prevent buckling. The digging edge is strong because of having an integral inside and outside wall joined together by numerous braces, and the use of manganese steel is stressed as giving the maximum resistance to shock and wear. The bridge type front illustrated has been used on the company's Missabe dipper.

## Starting Switch for Induction Motors

A new push-button operated oil switch, designated as the type Z O, for starting squirrel cage induction motors directly across the line, is being marketed by the Electric Controller & Mfg. Co., Cleveland.

This device is controlled from one or more push button stations which may be located at convenient points. It is provided with four pairs of heavy contact fingers, three of which handle the main line in the case of three-phase or two-phase three-wire motors, and the fourth pair handles the control circuit to the push button when the switch is arranged for no-voltage protection. In the case of two-phase four-wire switches all four lines are disconnected in the "off" position when the switch is wired for no-voltage release. When wired

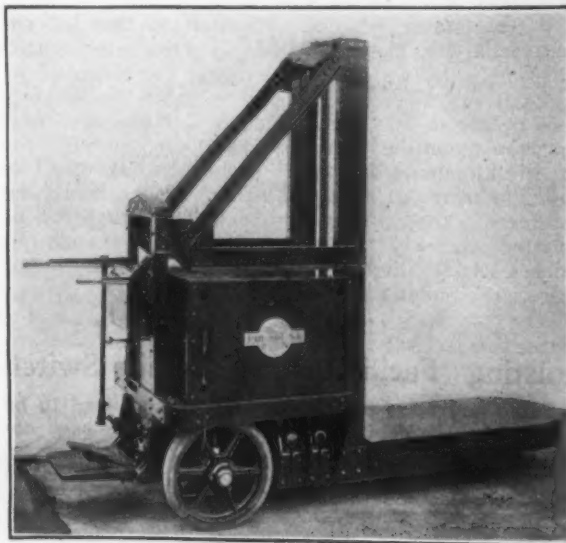
for no-voltage protection one line runs direct to the motor. The accurate inverse time element temperature overload device used in the switch is a feature stressed. It is claimed that if an attempt is made to start the motor with one phase open, the switch will open in less than five seconds. It is stated that it is impossible to burn out a motor due to phase failure or overloading when protected by this starting switch. The switch is arranged for conduit connection and compactness is a feature, the device being 9 in. wide by 13 in. high.

## Glue for Polishing

Bradford H. Divine, president Divine Brothers Co., Utica, N. Y., has just put into print the results of his many years of experience and experiments in the preparation and use of glue for metal polishing. He points out the extreme paucity of printed information on the subject and takes a long stride in the way of providing that information. His precautions on the treatment of the glue, from purchase to cooling after applying, are entirely from the practical standpoint. Particularly he cautions against overheating glue either before or after use.

## New Tier Lift Truck

A tier lift truck, the elevating unit of which is operated through a worm and worm gear to a single screw, has been added to the line of industrial trucks and tractors built by the Crescent Truck Co., of Lebanon, Pa. The elevating mechanism is mounted on ball bearings and runs in oil, and all working parts are accessibly mounted beneath the platform of the truck. The platform is 26 in. wide and 54 in. long. The driving unit employed is interchangeable with that on other



*The Elevating Unit Is Operated Through Worm and Worm Gear to a Single Screw*

of the company's trucks. The lifting capacity is 4000 lb., elevating the load 6 ft. high. The height overall is 87 in., the width, 41 in. and the length, 112 in. The turning radius is 95 in. and the wheel base 59 in. The truck is designated as the type GEH.

## Increasing Use of Steel Barrels

Steel barrels manufactured during May by thirty establishments are reported by the Department of Commerce at 570,962. This is a considerable drop from the revised figure of 594,971 for April but, with that exception, is the largest number in many months. It compares with 418,381 in May, 1924, which was the largest month with one exception in that year. Unfilled orders at the end of May amounted to 950,353 barrels. This figure has been dropping steadily from the peak of 1,586,034 reached at the end of December.



# Proper Sand Control Reduces Loss

Decrease in Molding Sand Cost Less Important  
Than Gain in Production of Good Cast-  
ings—Periodic Tests Essential

BY A. A. GRUBBS\*

**W**HILE the subject of foundry sands has always been important, it somehow has not claimed attention nearly so much as other materials and processes. Perhaps this has been due to a general belief that sand is not a major factor in determining quality of castings and loss percentages. Recently, particularly in the past two years, much more attention has been given the subject and the American Foundrymen's Association has considered it of sufficient importance to appoint a committee to study the problem jointly with the National Research Council. I have had the good fortune to work with this committee and its various sub-committees and so have been able to keep in close touch with developments.

So little is known about the physical and chemical properties of foundry sands and their relation to the production of castings that we hesitate to speak with authority on the subject. We have, however, gleaned some definite facts from various sources and have discovered certain other facts and principles which have enabled us, at the Ohio Brass Co., to accomplish a positive saving in cost of materials and just as positive a reduction in foundry losses.

## Properties of Good Molding Sand

What distinguishes good molding sand from poor sand is a certain combination of physical and chemical properties that adapts sand to the economical production of molds suitable to produce good castings. We might list these properties or characteristics as follows: Bond, permeability, fineness, clay content, colloid content, chemical analysis, refractoriness and durability. We are by no means certain that this list is either correct or complete. To just what degree each of these characteristics is important depends on the type of work we wish to make. Evidently large steel castings and small brass castings put quite different requirements on a sand.

The molder does not concern himself about all these properties. He is interested directly in the bond, texture and permeability of his sand. He wants a durable sand, too, and if working in steel he wants sand that is refractory. These properties might be called the molding properties of sand, because they are directly related to the workability of the sand. Clay, colloid content and chemical analysis are of interest only so far as they influence or determine the molding properties.

## Difference Between Bond and Clay Content

A word of explanation regarding these terms may be in order. Bond has been used by some to denote clay content of sand while by others it is used to denote the strength or cohesiveness, a property rather than a material. As this latter meaning seems to be coming into more general use, we employ the term in that way, reserving the term clay content to denote the material found in sand which cements the grains together. The bond or strength of sand may be measured by methods similar to those applied to other materials. The standard American Foundrymen's Association test is a transverse strength test, but compressive or tensile strength tests have been used by various foundries for the same purpose. The clay content as determined by the standard test is really an extension of the screen test down to those sizes which are too small for wire screens to separate. This clay is merely

the material which is fine enough to stay in suspension in water longer than 5 min., regardless of its chemical composition, and probably consists of small particles of hydrated iron and aluminum silicates, fine silica, mineral gels and organic matter.

Clays differ widely in their properties—some are far more sticky than others and some are more durable as bonding agents than others. The dye adsorption test is a valuable aid in estimating the value of clay bonding material. The quantity of dye adsorbed by a sample of sand is roughly proportional to its colloid content, or content of those particles which are so small that, when shaken up in water containing a small percentage of alkali, a very long time is required for them to settle out and the finest may never settle out. They are in the neighborhood of 0.001 mm. (0.0004 in.) in diameter. Because of their very sticky nature, these minute particles are of great importance as bonding agents. Test pieces prepared from this colloidal material have shown strength values that exceed that of Portland cement. The test serves, then, as a measure of the bonding value of clay.

## Tests for Durability

Recently there has been much discussion regarding the durability or life of molding sands. How long will it stand up in service and retain its bond, or how rapidly does it burn out? No standard test for this property has been developed, but two tests have been proposed and are being used with good results. R. F. Harrington, of the Hunt-Spiller Corporation, makes the dye adsorption test on the raw sample, heats it to 600 deg. Fahr. for 2 hr. and then repeats the dye adsorption test. He then calculates the deterioration. H. M. Dietert, of the United States Radiator Corporation, measures the bond strength of the raw sample, heats it to 600 deg. Fahr. for 2 hr. and then repeats the bond test and calculates the deterioration.

The cause of poor durability in molding sand is not well understood. It is known that heat tends to dehydrate the iron and aluminum silicates, which are colloidal in nature, and causes the tiny particles to cling together in aggregates. Unfortunately, the addition of water does not restore them to their original state, at least not to any appreciable degree. Mr. Hanley states that the aluminum silicates stand more heat than do iron silicates, hence clays rich in aluminum are more refractory and more durable than those rich in iron. There is considerable experimental evidence to support this theory. Almost without exception our best fireclays are rich in aluminum silicates and low in iron. We have noticed that sands of low durability usually show a higher loss in weight on ignition than do more durable sands. This indicates that part of the bond is due to organic matter which readily burns out, or possibly that the hydrates are broken down easily. At any rate, it offers possibilities of providing a rapid and easy test for durability.

## Permeability Permits Gases to Escape

Permeability is the venting quality of sand, measuring the ease with which gases can pass through it. It is determined largely by the grain size of the sand and in a less degree by its clay content. Some writers have urged that we should aim to keep the grain in our molding heaps as uniform in size as possible, so as to obtain maximum permeability. That is, most of the grain should lie on one or two adjacent screens and

\*Assistant Technical Superintendent Ohio Brass Co., Mansfield, Ohio. Paper read at monthly meeting, Pittsburgh Foundrymen's Association, Pittsburgh, April 20.

(Continued on page 1881)



## BUSINESS LOOKS FOR FALL RECOVERY

Expect firmer prices and better buying after summer inactivity is over

### Favorable Factors

- (1) Decline in commodity prices checked.
- (2) The P-V line (the main forecasting line of this service) rises slightly.
- (3) Stocks of commodities being liquidated.
- (4) "Real wages" of labor still high.
- (5) Money is easy and promises to continue so.
- (6) Business failures decrease.
- (7) Political conditions favorable.

### Unfavorable Factors

- (1) Production in basic industries not yet fully readjusted.
- (2) Stocks of commodities still too large, on the average.
- (3) Unfilled orders small.
- (4) New enterprises incorporated decrease.
- (5) Exports decline.
- (6) Employment of labor continues to decrease.
- (7) Future trend of prices uncertain.

The outlook for the summer is for considerable irregularity in business with gradually increasing stability at a level but little below normal. Business will probably recede a little more rapidly than usual for the season until August. At present the outlook is for recovery in the fall.

BY DR. LEWIS H. HANEY

Director, New York University School of Business Research

**D**URING May the process of industrial readjustment which began about February was still going on. It has become more and more apparent, however, that this readjustment is not to be very severe or prolonged. It was preceded by no boom and production on the average was carried but little above normal. Accordingly no great slump or depression would be expected.

The chief danger at present is that producers, in their desire to reduce unit costs by increasing volume, may fail to allow the readjustment to become complete. We might have the history of the 1923 and 1924 year-ends repeated. Some further curtailment in certain industries such as copper, iron and steel, textiles, and crude petroleum would have a favorable effect on

prices. It is desirable that stocks of basic commodities in first hands, which are still too large, should undergo further liquidation.

Buying from hand-to-mouth, which has become so prevalent, will probably continue to a large extent. This method of doing business, however, has been carried too far in some industries and it will be conducive to lower costs and better and more stable profits to have a larger volume of future business on the books.

The large amount of reliable information which exists regarding stocks and production in connection with the prevalence of hand-to-mouth buying will probably insure a very cautious procedure in business during the next few months. Business leaders are gradually feeling for the bottom of

markets. This is making the current recession unusually orderly. It insures against severe depression and makes possible a gradual decline to a level which can be maintained. In short, it makes it possible to call the present recession a process of stabilization.

Probably business will not, during the rest of the year, attain the level reached in the early part of 1923, but it is just as probable that the 1925 bottom will not be so low as that of last year.

### Stabilized ingot production forecast

**T**HE P-V line, which represents the ratio of commodity prices to the physical volume of trade, not only forecasts business in general but has forecast steel ingot pro-

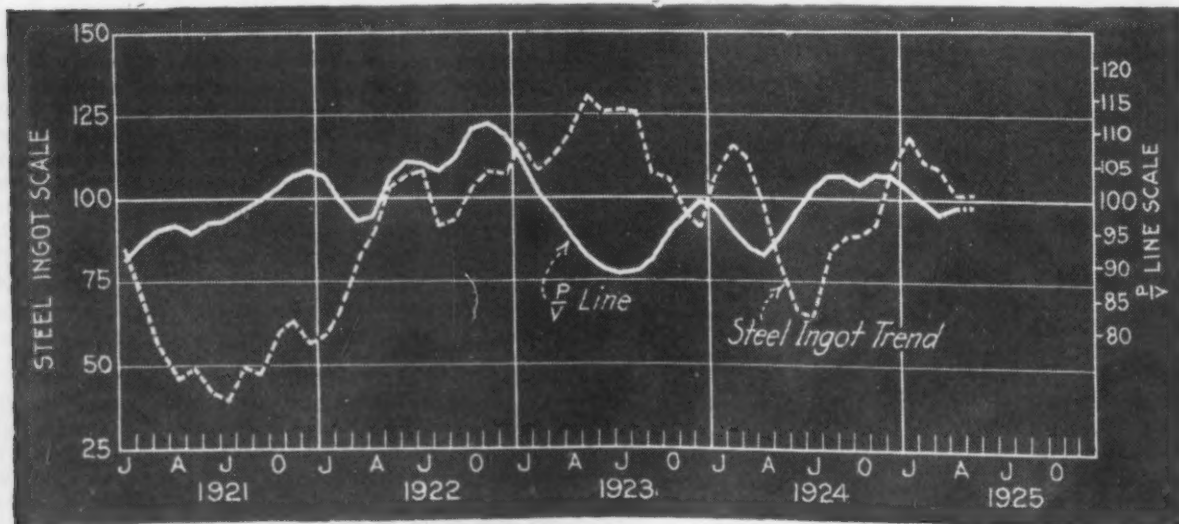


Fig. 1—Upward Turn in P-V Line Forecasts Check in Business Recession

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*The Iron Age, June 25, 1925*

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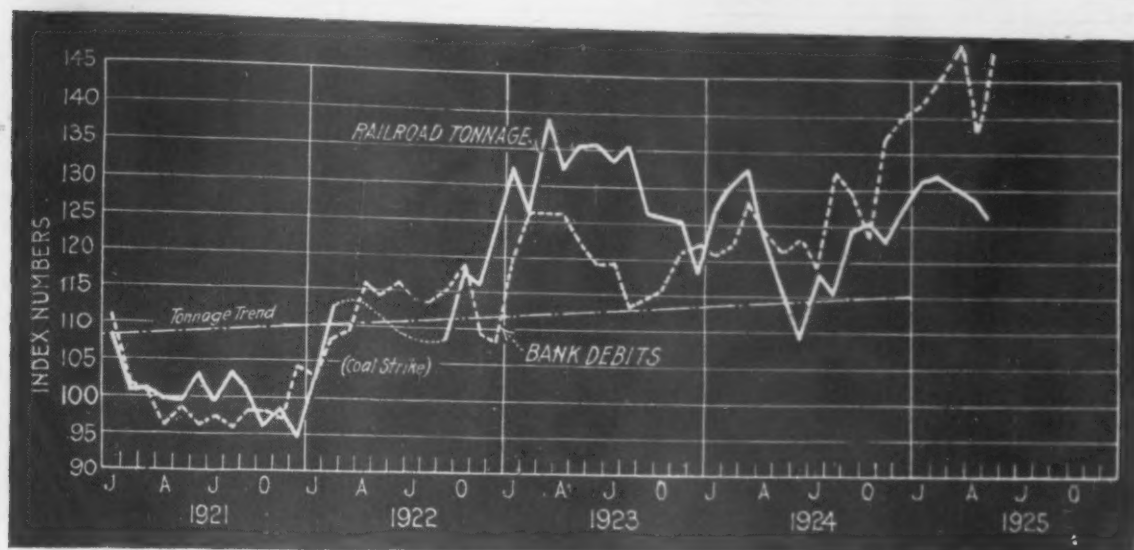


Fig. 2—Large Volume of Bank Debts Does Not Necessarily Mean Trade Activity

duction with considerable accuracy. A little study of Fig. 1 will show that the peaks and valleys of the P-V line have anticipated the trend of ingot production by from two to six months. The lead has recently become somewhat shorter than in earlier years.

At present the P-V line shows a slight upward turn. This forecasts a check to the general business recession and the approaching end of the decline in steel ingot output.

It is highly improbable that any declining trend in steel ingot production will continue beyond two months from now. The upturn in the forecasting line, however, is as yet so slight that it would be impossible to predict more than a rather stable condition in steel output, with slight variations possible in either direction.

#### Trade volume shows gradual recession

THE tonnage hauled by the railroads continues to decline (see Fig. 2) in the sense that it has failed to show the usual seasonal gains. The total number of cars loaded was approximately 4 million in March, 4.1 million in April, and 4.2 million in May, but this

small increase is less than usual. Moreover, the number of tons loaded in each car has steadily declined from 27.2 tons in February to 25.9 tons in April.

This indicates a gradual decline in industry such as has been forecast.

On the other hand, bank debits, as shown in Fig. 2, turned up again sharply in May. This was largely due to the gain in New York bank debits in the first week of the month, reflecting increased speculative activity. The May bank debits, however, failed to reach the March peak (making allowance for seasonal variation) and further declines are probable.

It may be said that May bank debits indicate a very large volume of business, wholesale, retail, and speculative—a volume which far exceeds that of the spring months of 1923 and 1924. The excess is partly due to higher prices, but after all allowance is made for this factor, the level of business still seems large.

The conclusions are: (1) There is a truly large volume of industry and trade. (2) A moderate recession is under way. (3) This recession is likely to continue until about August.

#### Steel barometers show signs of upturn

THE first real upturn in the rate of change in the unfilled orders of the United States Steel Corporation appeared in May. While the unfilled orders showed a large decrease, the rate of decline was less than in the preceding month. The curve shown in Fig. 3 is a very sensitive and reliable barometer of the steel trade and of industry in general, and this change in trend is significant. It is not yet certain that it forecasts a continued major upturn, but, in view of the low level from which it starts and the extent of the rise, it evidently means improvement.

The other curve shown in Fig. 3 represents the movement of the price of heavy melting steel scrap at Pittsburgh. The May average was \$16.75, which was a little lower than the figure for April. The rate of decline, however, was more gradual than in the preceding months and the first two weeks of June indicate some recovery. It may, therefore, be concluded that the scrap barometer will soon follow that of unfilled orders. It will be noted that the unfilled orders

(Concluded on page 1883)

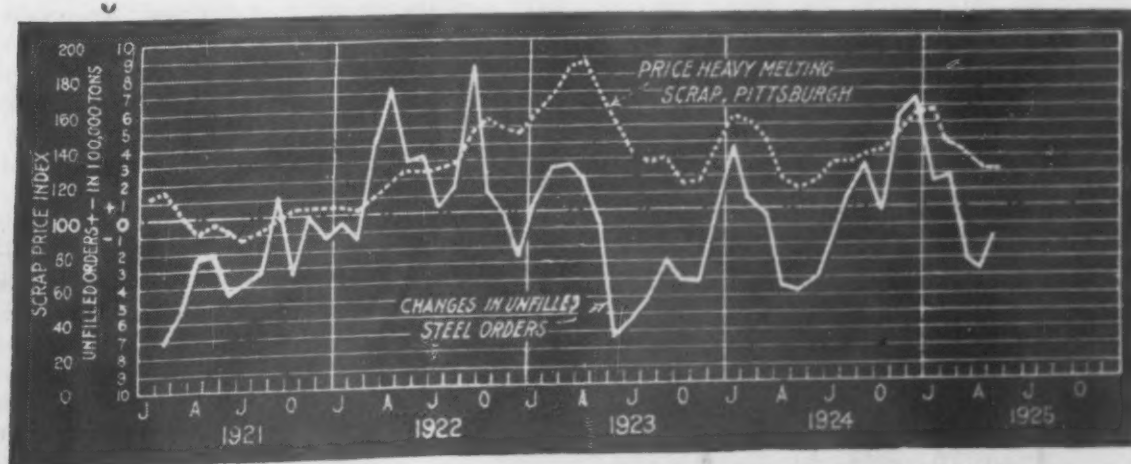


Fig. 3—First Real Upturn of Rate of Change of Unfilled Orders Came in May

ESTABLISHED 1855

# THE IRON AGE

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W. W. MACON, *Managing Editor*

Member of the Audit Bureau of Circulations and of  
Associated Business Papers, Inc.

Published every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York  
C. S. BAUR, *General Advertising Manager*

F. J. Frank, *President*

George H. Griffiths, *Secretary*

Owned by the United Publishers Corporation, 239 West 39th Street, New York. Charles G. Phillips, *Pres.* A. C. Pearson, *Vice-Pres.* F. J. Frank, *Treas.* H. J. Redfield, *Secy.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh: Park Building. Boston: 425 Park Square Building. Philadelphia: 1402 Widener Building. Cleveland: Guardian

Building. Detroit: 7338 Woodward Ave. Cincinnati: First National Bank Bldg. Buffalo: 833 Ellicott Square. Washington: 536 Investment Building. San Francisco: 320 Market St. London, Eng.: 11 Haymarket S.W.1. Subscription Price. United States and Possessions, Mexico, Cuba, \$6.00; Canada, \$8.50; Foreign, \$12.00 per year. Single copy 25 cents.

Entered as second-class matter, June 18, 1879, at the Post Office at New York, N. Y., under the Act of March 3, 1879.

PRINTED IN U. S. A.

## "Better Than a Boom"

AFTER the lapse of six months it may be of interest to check the accuracy of the appraisal THE IRON AGE made of this year's prospects. On the cover of the Annual Review Number, dated Jan. 1 there were printed a few paragraphs headed "Better Than a Boom." It was pointed out that the steel industry had gone through two revolutions, changing from the 12-hour to the 8-hour day in 1923, and in 1924 undergoing a sweeping change in its marketing system through the abolition of "Pittsburgh Plus." The quadrennial election was fresh in the minds of all, but it was suggested that while to have overcome radicalism meant much, the election had opened no magic road to prosperity. Stopping waste, increasing output per man and cutting cost of marketing were advocated, with the closing remark that while such a program sounded familiar "it would be a mistake to put it aside and just join the shouters for an easy boom, even if that would bring it."

We find six months later that the steel industry has had nothing like a boom but it has had a good tonnage. How good a tonnage, many may not fully realize. It is not simply that we have produced a great deal of steel, but that nearly all of that steel has been consumed, as heavy shipments by mills in the past few weeks prove, for if buyers had large stocks they would not consent to receiving these shipments. The first half of the year is not leaving the second half a heritage of liquidation.

The production itself has been large. Assuming ingot production during June at 70 per cent of capacity, the half year's output will compare as follows with the two preceding years, respectively the best and the third best of the six post-war years:

Steel Ingot Production—Gross Tons	
First half 1923 .....	23,326,965
Second half 1923 .....	20,158,700
First half 1924 .....	19,737,034
Second half 1924 .....	17,074,123
First half 1925 .....	22,350,000

Thus of five half years the one just ending is the second best. It may be suggested that the second half will not do so well, each of the past two years having shown a decrease. We do not

know that the experience will be repeated. Surely no one can contend that it is the common practice of the American steel trade to follow its precedents. However, there is the curious coincidence that in 1923 and 1924 the percentage decrease from the first half to the second half was the same, 13½ per cent. By the same factor this year's total would be 41,700,000 tons of ingots. That would place 1925 between 1923 and 1924 in tonnage, and 4 per cent above the mean of the two years. There would then have been three years with an average production just equal to the production in 1920, which was a "boom" year.

As to the steel outlook for the second half of the year, the prophetic point is not that steel buyers are in a conservative mood at the present time. It is that they have been very conservative for three months, yet they have continued to buy and they have allowed the mills to ship at a high rate. Estimating the rate of shipment this month at 70 per cent, that compares with 50 to 55 per cent in June of last year, when buyers had stocks to liquidate.

## Supply of "Common Labor"

FIGURES supplied by the National Industrial Conference Board put the number of common laborers admitted into the United States from July, 1924, to April, 1925, inclusive, the first ten months of the operation of the new 2 per cent quota law, at 27,908, or less than one-third the number, 97,886, admitted in the ten months a year earlier. It also appears that in the later ten months 44,750 common laborers left the country. Thus in the ten months the in-and-out movement represented an actual decrease of 16,842.

We were so accustomed, before the war, to heavy immigration, particularly of men who became common laborers, that we considered this movement as furnishing us a necessary "supply." The movement varied according to industrial conditions, and it was considered natural, normal and necessary. No one would have been likely to believe that ten or fifteen years later the immigration would be of insignificant proportions and we should still be able to get along in our work.

The smallness of the immigration recently is



from any viewpoint very remarkable, but there is a still more remarkable thing, that more common laborers left the country than entered.

We can adjust ourselves to almost anything, the chief requisite being time. The time varies greatly for different adjustments. It would appear from the figures that we have done much in rearranging our work to make up for the apparent "scarcity" in common labor; for two facts must be considered with these figures on emigration and immigration. First, there is no reason to suspect that people born in this country are turning more to common laboring work than formerly. Second, industrial activity in the United States has been at a moderately high level. There has been no depression such as those which in the past caused temporary movements out of the country.

There is practically no physical operation which cannot be done by machinery and practically none that cannot be done by hand. Almost wholly it is a question of which way is the better. Conditions dictating the choice of method change and the main point is that the conditions should not change more rapidly than is convenient, in making the shift in method.

At the same time it must be admitted that common labor has not been invited to leave the country by poor wages being offered. Measured in purchasing power common labor rates are very much higher than before the war. Economically common laborers are much better off. The law limits their coming in, but it is remarkable that so many have been disposed to leave.

### Machinery Gifts to School Shops

**M**ANUFACTURERS of machinery and other industrial equipment, notably machine tools, wood-working machinery and electrical appliances, are approached at times by representatives of trade and manual training schools, and, less often, of engineering schools, with requests to contribute their products to shops and laboratories where students receive their training. The argument is that the donor would get back eventually the money value of his gift, together with handsome interest, in the form of good will among the students, as they might pass into industries where similar equipment is used on a large scale. Such a young man, it is urged, would become so accustomed to a particular make of machine that, when he came to a position of authority in the buying, he naturally would lean strongly toward his old friend. Once upon a time the argument was considered a sound one. Nowadays it is doubted.

These educational institutions cannot be blamed for soliciting aid of this sort. Many of them are poor and find it a constant struggle to keep their shops and laboratories reasonably close to a modern basis. Older schools sometimes find their equipment practically obsolete and nearly worn out by long use, and resent having to train their boys under such a handicap. Manufacturers are inclined to be generous with these institutions, upon which they must depend for their engineers and to a large extent for their execu-

tives. But many owners prefer to show their interest in the schools in some other way than by contributing machinery and other appliances of manufacturing.

Conditions have changed greatly in recent years. In the machine tool field, for instance, they are vastly different. In the old days types of machines were few in number and well-defined. There were lathes, planers, drilling machines, milling machines, boring mills, shapers, tool grinders and a few others. Models changed slowly and refinements were usually of a minor character. Then, of a sudden, began the period of extraordinary and rapid change. The number of types of machines increased amazingly. A machine which was up to the minute when it was bought might be far behind in a few years. The era of specialized machinery is well along.

Therefore, as the average manufacturer of machinery sees it, to install his product in a school shop would be of very doubtful value. He might even argue that, from the standpoint of dollars and cents, he could better afford to give to a rich institution than to one poor in money, for in the former case he might reasonably hope that his machine would be superseded before it became out of date.

In the case of the poor institution he could be pretty certain that the machine would remain in use by students far beyond the time when he himself ceased to be proud of this particular model. The impression made upon the student might be that its builder was hopelessly behind the times; yet for teaching the theory of machine shop practice the older machine might serve its purpose well enough, provided the young men were given a comprehension of modern machinery by visits to industrial plants or by working in them during vacations. What is true of machine tools is equally true of almost every class of industrial equipment.

### Boycotting Foreign Capital

**T**HOSE who have been protesting against the investment of American capital in foreign industrial enterprises which would compete with manufacturers here will find ammunition in the charges made by the press of Great Britain of boycotting and other unfair trade practices in certain European countries. According to this information, manufacturing industries which owe their present activity to the investment of foreign capital are seriously discriminated against in the countries in which they operate.

In one case it is charged that through pressure of various sorts the advertising of a large British corporation had been barred from tram lines in one European capital; that shopkeeper tenants who sold the goods of the company had been evicted, and in various other ways a campaign against the company had been carried on—all because of the fact that it has a substantial investment in the country.

The *London Financial News*, commenting upon this strange situation, says it "provides a characteristic example of the post-war mentality of borrowing countries toward their creditors, which



may be summarized in one sentence, 'We want your money but we do not want your enterprise.' While they are more anxious than ever to secure loans from the lending countries, they raise a great variety of obstacles against the penetration of foreign enterprise. The same is true in several other countries, both within and without Europe." The latter reference is to two South American countries, it is explained, which have recently introduced legislation unfavorable to foreign companies, "though both countries may in due course of time be in need of foreign financial assistance." The *Financial News* continues:

The anti-foreign attitude of borrowing countries is all the more remarkable as it coincides with a scarcity of capital available for external investment, in relation to the largely increased demand. At present there are only two countries which are in a position to invest abroad on a large scale—Great Britain and the United States—while many other countries which used to export capital before the war, such as France, Germany, Belgium, Switzerland, have become borrowers themselves. It may safely be stated that the total of the economically sound demands for British and American capital by foreign would-be borrowers is more than 10 times higher than the amount available for such purposes. The lenders are therefore well in a position to choose among the great number of applications they are receiving, and it is only natural that they should give preference to those countries which give decent treatment to foreign companies.

Discrimination like that charged in the British press, if practised against enterprises financed by

American money, would soon check the flow of American capital into the offending countries. Natural resentment is a powerful influence. However, it is difficult to believe the practices complained of are more than sporadic. Jingoism as a political epidemic has had its run, now and then, on both sides of the water. But in the present situation in international finance, European demonstrations against American enterprise would be quite in the class of the hunger strike in their capacity for punishing the boycotters.

### Small Blast Furnaces in Europe

**S**TRIKING testimony to the difference in size between American blast furnaces and those in use in many parts of Europe is afforded by figures in this issue, showing 1924 pig iron production in Poland, when compared with our own production figures published from month to month. Thirty-three furnaces, on the average, were operated in Poland last year, producing altogether 330,903 tons of iron. This figures out at 10,027 tons per furnace and 27½ tons per furnace per day. American furnaces active in May averaged 208 in number, turning out 2,930,807 tons of iron. This was 14,090 tons per furnace or 470 tons per furnace per day.

It will be noted that the production in one month, from an American furnace, is 40 per cent higher than the yearly output of its Polish contemporary. On the daily basis the ratio is more than 17 to 1.

## CORRESPONDENCE

### Warrant Yards Would Not Help the Foundry Pig Iron Market

*To the Editor:* The writer has read an article by Lloyd H. Atkinson in your paper of June 11 entitled "Less Foundry Iron Being Melted," in which it is claimed there is a greater fluctuation in foundry iron prices than in those of other iron commodities. Mr. Atkinson suggests as a possible remedy going back to the old English method of the warrant yard.

The writer must absolutely differ with Mr. Atkinson both as to the cause and effect of the fluctuation in the prices of foundry iron during the period which is referred to, or since the war.

First: Mr. Atkinson has overlooked the use of cast scrap during this period, as at one time very large quantities were available.

Second: He must realize the absolutely changed conditions in selling foundry iron. The pig iron merchant who confined his attention to selling the production of various furnaces making foundry iron is almost of the past, as there are comparatively few furnaces confining their production to the merchant trade, and these mostly specialize on irons for use in adjacent territory.

Third: Today the merchant pig iron business is largely in the hands of furnaces controlled or operated by steel companies which make an overproduction of iron for their own uses and enter the foundry trade as a means of selling their surplus product.

Fourth: The laws of supply and demand, to the writer's mind, are the only laws that can cover the price of foundry irons.

Fifth: The issuing of warrants in this country

was an absolute failure; in fact, it has been abandoned in England at the present time. It was found that it neither stabilized the price nor regulated the production of pig iron, creating a speculative element which operated against the actual user.

Where every iron making district in this country produces a different grade of iron, the writer does not believe that the issuing of warrants, even if desirable, is practical. Pig iron as a commodity can always be used as collateral without the issuing of warrants and as the only use of warrants today would be the borrowing of money, one cannot see any benefit gained by having them.

To the writer's mind, the seller of merchant pig iron has to adapt himself to the changed conditions covering the buying and selling of this commodity and no law or legal agreement can be made to regulate the price except the law of supply and demand.

FRANK SAMUEL,

Philadelphia, June 17.

### Blast Furnace Temperature Readings

*To the Editor:* Referring to the article on pages 1639-40 of your current issue describing a method for determining the condition of blast furnace linings by means of temperature readings:

Borrowing for the sake of illustration from the field of medical science, it might be said that this method as applied to blast furnaces is comparable to locating in the human body a specific organic defect, after it has developed and just prior to the application of remedial or surgical action by the physician. And in the case of man, as well as furnace, it must evidently be the primary aim of the conscientious doctor to guard against such emergency by directing living habits along orderly lines and promoting the probability of a ripe old age by wholesome diet. In prevention rather than in cure lies success in either case.

However, the suggested method is entirely feasible

and has to my knowledge been in use at several furnace plants for a number of years. Not seldom pyrometer wells are provided in the brickwork at the time of relining.

The author of your article, who has to his credit a number of most valuable scientific investigations in the field of blast furnace performance, deserves, I believe, unqualified praise for interestingly bringing this means of control to the attention of a larger audience.

W. MATHESIUS.

Superintendent Blast Furnaces, Illinois Steel Co.  
South Chicago, June 12.

*To the Editor:*—We have had thermo-couples inserted through the furnace shell and for 9 in. into the brick work for several years. Our thermo-couples are spaced 60 deg. apart, six in all, in a horizontal circle about 20 ft. above the mantle. Thermo-couples and leads are permanently installed, the leads extending from the shell down to the pyrometer room, where we take temperature readings at intervals.

This installation was for the sole purpose of noticing increases in the temperature of the brick work, to indicate where the furnace lining might be growing thinner in one place than in another, and gives a good indication of conditions.

We consider it an excellent idea which should become general, and the Bureau of Mines article is very valuable.

H. E. McDONNELL,

Superintendent Blast Furnace Department,  
Weirton Steel Co.  
Weirton, W. Va., June 15.

*To the Editor:* I have read your article describing a method of checking up on wear on furnace linings. This is being adopted as standard practice at several plants, to my knowledge. The method described is especially useful where conditions exist which are difficult to control, such as poor stock distribution, too great a variation in size of ore, coke or limestone particles, scaffolding caused by wet ore, soft coke, incorrect slag composition or incorrect furnace lines.

Any increase or decrease in the temperature readings taken in the furnace lining denotes either a wearing away of the lining or of the scaffolding. A decided increase in the temperature at any one point may mean that channeling or cutting away of the brick work has already started, with a certain curtailment of the campaign, unless the coil can be stopped, either by a different arrangement of tuyeres, cooling of the inwall or charging methods.

This method provides the furnace superintendent with a means of getting advance information on conditions inside the furnace before they became apparent in more pronounced fashion by irregular furnace operation, with a consequent poorer degree of furnace practice. In my estimation, the temperature measurement, applied as a means of determining the conditions of the furnace lining, is another step in getting larger life from our blast furnace linings.

ARTHUR FARRELL,

Manager Furnace Department,  
Cleveland-Cliffs Iron Co.

Marquette, Mich., June 17.

### Normal or "Ideal" Steels

*To the Editor:* The definition of terms is always important, but frequently we do not wait for the definition and assume the meaning to be what the term seems to signify. Therefore, it is important that we select our terms very carefully first and then define them.

Work was begun a short time ago on studying the effects of small amounts of impurities in steel specifically with reference to their effect on the hardening ability. The usual run of steel was named, more or less, "abnormal"; and the steel that would harden 100 per cent was called "normal." Webster says normal means "average, natural." But "normal" steels are not average and whether they are natural or not depends on the company that makes the steel.

Also we have a term common in the metal indus-

tries, which is known as "normalizing." Immediately one is led to believe that an "abnormal" steel can be "normalized"; so it can, but it cannot be made a "normal" steel. This sounds like a dictionary advertisement, but why put the public into such a frenzy? We should find a new term.

The so-called "normal steels" are really "ideal steels"; and the quicker we begin to call them "ideal," the better understood the term will be.

FREDERICK G. SEFING,

Metallurgist.

Michigan Agricultural College, East Lansing, Mich., June 15.

### Protection to Inventors Pending Publication of Patent Papers

*To the Editor:* One of my clients writes me as follows:

"In the June 4 issue of THE IRON AGE on page 1659 it is stated, 'Secrecy as to the details of an invention may be had by postponing the publication of patent papers, even while protection is being accorded.'

"We would like to know if this is true. If so, how long may the publication of patent papers be postponed while protection is being accorded?"

I have not as yet seen the article referred to, but working on the presumption that my client has quoted your article properly, I believe a few words of explanation might be of interest to your readers, inasmuch as the statement is only partly true and might be very easily misunderstood.

Certain rights accrue which may be taken advantage of at a later date; when an inventor first conceives the invention; when he first makes a sketch and a written description; when he first discloses it to others; when he first reduces the invention to practice; or when he constructively reduces it to practice by filing an application in the U. S. Patent Office.

These activities or rights, as they might be called, are of value in case the Patent Office declares an interference, which is a procedure to determine who is the first inventor between two or more applicants or patentees. The law in regard to interference practice is rather complex, but the Patent Office works on the presumption that the first to file is the first and true inventor and is made the senior party in the interference, and it is the duty of the junior party then to overcome this presumption; in other words, the burden of proof is thrust upon the junior party.

Again, patent applications, after being filed and acted on by the Patent Office must be amended within a year after a rejection or an action by the examiner, and the office states that the amendment as called for by the examiner must be full and complete, and the Patent Office does not favor the dragging out of applications in the Patent Office to cover a number of years.

Of course, if an interference is declared, the interference will have to be fought to a conclusion before a patent can issue, but otherwise the office will not allow an application to be pending in the Patent Office for more than three or four years.

After the application has been allowed the final fee may be paid any time within six months after the date of allowance, and it may be that your writer wishes to convey the thought that protection is being accorded during this six months. The only protection accorded is that the application is still secret matter, not open to the public; and if there is any application filed on a similar invention the new application will be thrown into interference with your allowed application. But as far as actual protection is accorded, the statement is not wholly true, as one cannot sue on a patent application, but has to wait until the patent has issued.

The word "protection" to the mind of the laymen would convey the thought that one could notify infringers and sue infringers and thus have protection accorded during the pendency of the application; but the truth of the matter is that the inventor or owner of the patent application will have to wait until the patent issues before suit can be started.

PARKER COOK.

Washington, D. C., June 11.



## AWARDED SCOTT MEDAL

### Recognition of C. H. Norton's Epochal Work in High-Power Grinding Machines

Charles H. Norton, consulting engineer of the Norton Co., Worcester, Mass., who is credited by engineers with having done more than any other man to



CHARLES H. NORTON

bring the grinding machine to its present high stage of development and broad field of industrial usefulness, was awarded the John Scott medal "for the invention of accurate grinding devices of high power," at the commencement exercises of the University of Pennsylvania June 17.

The John Scott medal is awarded for exceptional achievement in the field of mechanical arts. It was established under the will of John Scott, "chymist," of Edinburgh, dated April 2, 1916. The legacy is entrusted to the corporation of Philadelphia, and

the award was made by the Board of Directors of City Trusts of Philadelphia to Mr. Norton, who was elected to receive it by an advisory committee consisting of A. W. Goodspeed, secretary, representing the University of Pennsylvania; S. M. Vauclain, representing the American Philosophical Society, and H. H. Donaldson, chairman, W. B. Scott and Theobald Smith, representing the National Academy of Sciences.

The honor conferred on Mr. Norton marks worldwide recognition of his inventions. They have been one of the great factors in low cost and rapid production of motor cars, aeroplanes, agricultural machinery, locomotives, machine tools and many other types of machinery and apparatus. They include a number of radical improvements in grinding machine design, which combined made it practicable to secure exact size on repeat work and, therefore, to increase output greatly. Because of these mechanisms, where sizing formerly was uncertain and required much skill, the modern grinder operated by a relatively unskilled workman will produce more accurate work than used to be possible even with a highly trained mechanic as the operator. The inventions include the shape of the table, the mounting of the headstock and foot-

stock, the new and unusual mounting of the wheel slide without an adjustable gib, the micrometer cross feed for the wheel slide and the "arc of a circle" steady rest shoe.

Besides these fundamental improvements Mr. Norton has invented many special machines and attachments for the application of his ideas in industry. His locomotive piston grinder, car wheel grinder, heavy roll grinder, car axle grinder, crankshaft grinder and camshaft grinder were in each instance, so far as is known to the Norton Co., the first grinding machine ever made for the purpose.

### High-Power Machines with Precision

Mr. Norton was the pioneer in developing the art of grinding metal with powerful machines and at the same time securing precision results. When he began his task of building the first machine, soon after he went with the Norton Co. in 1900, grinding machines had been confined to toolroom work almost exclusively. Even 15 years ago few manufacturers made use of them in regular production. The work they handled was very small.

Mr. Norton's vision went far beyond this. His theory was that the engine lathe, made much more powerful than ever before, should rough out the work, with no attempt at accuracy and finish, and that the grinding machine should do the rest, producing a cylinder or whatever other form with great rapidity and within precise limits. The advent of the high-speed cutting steels permitted the lathe builders to reach remarkable limits of power. Thus the development of the new grinding practice and the development of the machine tools of other types proceeded side by side.

Charles Hotchkiss Norton was born in Plainville, Conn., Nov. 23, 1851. At the age of 15 he entered the factory of the Seth Thomas Clock Co. in the neighboring village of Thomaston. In the 20 years he remained with the famous clock makers he advanced to a high executive position in manufacturing. He went from there to the Brown & Sharpe Mfg. Co. at Providence, R. I., and became a designer of grinding machines. A few years later he became a partner in the firm of Leland, Faulconer & Norton of Detroit, which later grew into the Cadillac Motor Car Co.

His tenacious belief in the future of the grinding machine was shared by the Norton Co. management, and the Norton Grinding Co. was organized, later to be merged in the Norton Co. as the machine division. Mr. Norton was for years the superintendent as well as the inventor and designer, but of late years he has acted only in an advisory capacity, though in the interim important patents have been issued to him.

### Plan of Reorganization of Case Plow Works

The J. I. Case Plow Works, Inc., a Delaware corporation, is being planned to acquire the assets of the original company by that name in order to avert receivership. Banking creditors and the Illinois Steel Co. are said to have approved the reorganization, which will involve no program of refinancing. In the adjustment, the Illinois Steel Co. and banks will receive for their claims 20 per cent in first mortgage bonds, 30 per cent in class A stock at par and four shares of class B stock for each share of class A so issued. Other creditors will be paid in cash. Capitalization of the new company will consist of \$1,111,200 of first mortgage, 5 per cent bonds, 160,000 shares of no par class B stock and 16,668 shares of \$100 par value 6 per cent class A stock.

President H. M. Wallis said in a letter to stockholders:

"During the last three or four years because of agricultural adversity, cancellation of orders, shrinkage of inventory values and loss of volume, heavy losses were unavoidable and it was necessary to call our creditors for repeated extension of the company's notes. Conditions have improved during the last year but it is the consensus of opinion that cumulative

losses are so large that it is impossible with the heavy load to earn sufficient to repay the money loaned the company."

The effect of this plan as submitted is a reduction of nearly 50 per cent in the principal debt.

### Closes Anthony Fence Works

The American Steel & Wire Co. will discontinue operations at its Tecumseh, Mich., plant, known as the Anthony Works, on June 30. The equipment, consisting of wire fence machines, will be removed to another plant of the company. The capacity of the works was 10,000 net tons of wire fencing a year. Formerly known as the Anthony Fence Co., the plant was taken over by the American Steel & Wire Co. July 1, 1910.

### Steel Furniture Shipments

WASHINGTON, June 22.—The Department of Commerce announces May shipments of steel-furniture stock goods, based on reports received from 22 manufacturers, at \$1,577,779, as against \$1,633,106 in April and \$1,505,367 in May of last year. For five months the total has been \$8,004,708, against \$8,023,027 last year.



# Foreign Trade Is Great and Growing

The 1924 Record May Be Passed This Year—Our  
Costs Must Be Kept Down—Europe Will  
Continue to Be Our Best Customer

BY JAMES A. FARRELL

OUR exports and imports for the calendar year 1924 aggregated more than \$8,200,000,000—more than enough to pay for the construction of twenty Panama canals, or at the rate of one such canal every fifteen days.

The volume of this colossal foreign trade was more than 93,160,000 tons of 2240 lb. We cannot visualize that. This trade went on, last year, at the rate of more than 312,000 tons for every working day. It required the daily arrival at, or departure from, the different American ports of from 60 to 70 ocean steamships averaging more than 8000 tons of carrying capacity. It required the daily service of more than 10,000 freight cars, carrying an average load of 30 tons. If it were conceivable that all that volume of different commodities could be handled in a day through any one port, it would require a 50-car freight train every seven minutes for the full 24 hours, to clear the docks.

There is nothing like this foreign trade of last year in the history of the United States. It surpassed all records in volume, but this year gives promise of exceeding it. There was a brief period, during the time of inflated prices in 1920 and 1921, when the number of dollars represented by our exports and imports was somewhat larger than last year. But even in those years the quantity of our products sent abroad and the quantity of foreign products imported did not equal in volume our trade of 1924.

## Trade of 1913 Nearly Doubled

The figures of our trade for 1924 represent a growth of production and enterprise in the United States that is cause for satisfaction. It was very nearly double that for 1913, the last year before the war, whether measured by value or by quantity. The war stimulated activities and injected an element of violent fluctuations, with a period of apparent, but fictitious, increase, from which, I think it is safe to say, we have now recovered, so that the growth shown in the last three years may be compared, with reason to the development during the ten year period prior to the war.

The trend is again steadily upward. There are sound reasons for it. (Do not interpret that as a prediction that there will be no setbacks). From the very nature of our trade there are bound to be fluctuations which will affect more or less seriously various factors of it.

Before the war a small number of items comprised the great bulk of our exports. Twenty different kinds

of commodities then furnished approximately 90 per cent of our sales to foreign countries. In 1924, however, the first 100 items in our list of exports constituted only 87.75 per cent of the total. Of these 100 items, 72 contributed less than 1 per cent each. In the remaining 12.25 per cent, several hundred different products were represented, each by a fraction of 1 per cent.

## Must Get Costs Down to Meet Competition

Generally speaking, we have the productive capacity in this country to enable us to maintain a considerably larger overseas commerce than we now enjoy. Export prices, however, are determined by competition in foreign markets. Therefore it behooves us to keep our production costs at the lowest possible level through resourcefulness in the use of mechanical devices, in the utilization of every possible improvement in facilities for production and economy in overseas distribution.

Sometimes, indeed, we encounter price competition in foreign markets which we cannot meet. We even face at times foreign competition in the domestic market so severe that we cannot meet it.

This situation, however, is not unusual; we have always had to deal with it, and on the whole we have met it, as our constantly growing foreign trade proves. We have met it by quality of product, by satisfactory service to the buyer, and close attention to his needs, even when at times we could not meet it in price.

We need not ignore, moreover, the fact that while we are facing the competition of other industrial nations in foreign markets, we are also giving them occasion to face American competition in the same fields. Signs are not lacking that they frequently find our competition quite as interesting as we find theirs. It is not an unmixed evil. There are some elements of compensation in it, one of which is the fact that competition usually widens the range of selection for the buyer and not infrequently results in an increased total trade, and we have our chance to get our share of the increase.

## All Cannot Meet Foreign Prices

In an export trade such as ours, made up of thousands of different products, the output of hundreds of different concerns, there is always bound to be a certain variation in the sellers' prices, so that at times it happens that one concern will find itself unable to meet a particular foreign competition, whereas others can meet it. The one who cannot is likely to declare that

## Chairman Farrell Takes a Hopeful View

THE annual address of Mr. Farrell as chairman of the National Foreign Trade Council has been a notable feature of every foreign trade convention. Commonly he has discussed the merchant marine problem, of which few men in the nation have an equal grasp. At the Twelfth Foreign Trade Convention, at Seattle this

week, Mr. Farrell's address dealt with the foreign trade outlook. Portions of it are given on this and the following page. It gives reasons for expecting growth in our trade with other nations and indicates that some who have believed the tide was ebbing have not given full credit to the facts.

there is a depression in foreign trade, or even, as we hear occasionally, that it has been destroyed by foreign competition. It is unsafe and unwise to make such generalizations. The authoritative record of our trade as a whole shows that it is making steady progress, and that is its promise for the future. Month by month we get the record of failures in the domestic as well as in the foreign trade. They are regrettable, but unless they are exceptionally widespread and numerous they do not prove much else than that certain concerns have not been able to succeed where others have.

#### An Incomparable Home Market

We can produce, we can sell, and we have done fairly well in meeting foreign competition, even in periods of exceptional severity like the present. Neither we nor any other people can sell if we cannot find markets which have the power to buy. That is one respect in which the American exporting manufacturer has an advantage over all others. *He has a market of enormous capacity at home, almost always capable of absorbing the chief part of his output*, thereby enabling him to reduce unit cost through increased production. The constantly mounting sums spent yearly in this country for luxuries, amusements and trivialities, testify to the extraordinarily rapid increase of wealth here. Based on this home market our manufacturers are well justified in looking abroad for fields, the supplying of which will enable them to produce more than they can expect to sell at home.

There is an impression widely prevalent among Americans, that Europe has been a purchaser only of our raw materials, but even a casual examination of the detailed Government reports will show that Europe is a heavy purchaser of a great range of manufactured articles and luxuries, as well as of raw materials and agricultural products.

Europe in the nature of things will regain a portion of her former trade in neutral markets as soon as industry becomes reconstructed in the nations of that continent. There are already signs that the manufacturers of Europe are renewing their former trade affiliations.

#### Europe's Buying Power Coming Back

Europe is steadily growing into a better condition. Every year since the signing of the armistice, there has been distinct improvement. In most European countries the people have gone back energetically to work. The Russian experiment with communism is still slowly working out its disastrous course, but in practically all other countries, with the possible exception of Great Britain, where unemployment continues to be a serious problem, the improvement is marked. In Italy, France, Belgium and Germany unemployment is practically negligible.

Year by year, in all these countries, production is increasing, however, and with it, of course, consumption. Their buying power is coming back. In that process they are taking increasingly large quantities of the products, raw and manufactured, of other countries, including the United States. That is why Europe as a whole continues to be America's best customer.

#### Not a Great "Shortage" to Be Made Up

It is not to be expected that with a return of the old buying power there will be an effort on the part of peoples who have lived under restricted conditions for so long to obtain all the things they have done without in these ten years. The deprivation they have endured does not constitute in its entirety a shortage which must be made up. There are some distinct elements of shortage, chiefly in land transportation, but in most cases the need or desire that was unsatisfied has passed with the lapse of time. What is to be expected, however, is that with the yearly increase of wealth through steadily growing production there will come corresponding effort to get back to the former living conditions and to improve them. That is merely the normal course of human nature. The trade of Europe and the rest of the world will then show the

same sort of trend which that of the United States has been showing, and in that general increase there will be further opportunity.

#### American Investments Abroad Will Help

One result of our change in economic stature from a debtor to a creditor nation, is the increased readiness of American capital to seek or accept investment abroad. We are all familiar with the extent of foreign loans placed in this country in recent months. The proceeds of such loans go abroad, as a general rule, either in shipments of gold or as exports of merchandise, including raw materials. Unquestionably the large excess of our merchandise exports over imports last year represented in great part foreign loans placed here. Such loans may, and often do, mean continued foreign trade as well as these immediate exports.

A short time before he took office, President Machado of Cuba, in a speech at New York, called attention to the remarkable growth of trade between Cuba and the United States in the last 20 years, an increase from \$70,000,000 to \$560,000,000. It is estimated that more than a billion dollars has been invested in Cuba by Americans. Most of it has gone to help develop the production of sugar, tobacco and the other natural products of Cuba. That increased production has led to the increased trade with us. It has given the people of Cuba correspondingly increased capacity to satisfy their needs and desires, and that very capacity to buy more has led them to want more.

In 20 years our trade with Cuba has grown about 700 per cent. There has been no 700 per cent increase in the population of Cuba. The actual increase has been less than 50 per cent. But with a 50 per cent increase in population and a 700 per cent increase in trade, it is made clear how the investment of American capital in foreign countries may develop American foreign trade to the benefit of all our people. It is clear that American capital is helping to restore the productive capacity and the buying power of Europe, a result that is certain to be felt beneficially in all countries. As American capital seeks investment in other parts of the world, South America, Asia and elsewhere, there will, no doubt, be results similar in character, although not in degree, to those obtained in Cuba.

#### Changes Have Affected Profits

I have been taking, of course, the long view of our foreign trade outlook. The elements which enter of necessity into consideration of the immediate future are too numerous to be discussed here. But when we hear, as we not infrequently do in these days, one or another of our friends speaking of depression in foreign trade, it is well to consider whether he is voicing a personal or a common feeling, whether he is describing an individual or a general condition.

It is well, also, to remember that there has been a considerable shifting in the manner of doing business which has affected profits, in some cases quite materially. Buying has undergone a marked change. Orders are more numerous, but for smaller quantities. The volume grows, but the cost of handling the business increases out of proportion to the increase in amount. Thus, while we may rejoice at the steadily growing volume of our foreign trade, it may be quite true that the profit resulting from it is not as satisfactory as that derived from a smaller volume. And with a narrow margin of profit, influences which at other times would hardly be noticed may be felt keenly. In such a situation small matters may, through discussion, produce unfortunate results. Constant prediction of misfortune not infrequently prepares the way for it.

In the long view, however, I think we have many reasons for confidence. Chief among them is the fact that the whole world is growing. Its production is increasing, and that means increased buying power. International trade grows as the world grows, and we may reasonably count upon getting our share. The situation in our foreign trade is one of hopefulness and we should look upon it as an increasing element in the prosperity of our country.



## ATTACK FLEXIBLE TARIFF

### Rejection of Commission's Sugar Recommendations Brings Denunciation

WASHINGTON, June 23.—The refusal by President Coolidge last week to accept the recommendations of the Tariff Commission for a reduction in the duty on sugar gave rise to a report that the President would urge the abolition of the Commission itself. Another report was to the effect that he would ask Congress to repeal the flexible provisions of the Tariff Act. It was made known at the White House that the President had neither idea in mind. On the contrary it was stated that while suggestions looking to the repeal of the flexible provisions had come from various sources, including prominent Republicans, the President doubted if there were any appreciable sentiment for repeal of the provisions.

Senator Smoot, Chairman of the Committee on Finance, and other prominent Republican members of Congress, have repeatedly said that there probably will be no changes in the tariff at the next session of Congress.

Representative Oldfield, Democrat, of Arkansas, seized upon the President's action in turning down the majority recommendation of the Tariff Commission for a reduction in the duty on sugar. He contended that the Tariff Commission was created to be a fact-finding and bi-partisan body, its sole duty being confined to

investigation of cost of production and allied matters, which were to be reported to the House Committee on Ways and Means. He attacked the Republicans for changing the duties of the Commission and especially for the authority given it under the flexible provisions. It is maintained, of course, that the new law did give to the President, through the Commission, powers to change rates and duties which heretofore rested solely in Congress.

Many argue that the flexible provisions which are responsible for this change in the tariff policy of the country are unconstitutional. Representative Oldfield said that he thought the flexible provisions should be repealed and the authority of the Commission restored to the purpose originally specified by the act of 1916.

It also is contended that business men are not satisfied with the operation of the flexible provisions, their chief objection being the slowness with which the machinery operates. This has been strikingly demonstrated in a number of cases, among them being that concerning the inquiry on pig iron. While the Commission has not made any attempt to get pig iron costs abroad, its effort to get the cost of production of other foreign manufacturers has often met with failure and caused considerable delay. Some think the procedure as to getting costs of foreign production would have to be changed if the flexible provisions are to operate satisfactorily, and that perhaps these costs could be approximated by recourse to invoices taken from the ships' manifests.

### British Steel Exports Up in May—Imports Sharply Lower

WASHINGTON, June 23.—Representing an increase of 8 per cent over the preceding month, exports of iron and steel from Great Britain in May totaled 322,140 gross tons, according to a cable received by the Department of Commerce from Acting Commercial Attaché Mitchell, London. The heaviest gains were made in foreign shipments of rails, plates, sheets, tin plate and tubular products.

Only 205,424 tons of iron and steel were imported into Great Britain in May. This is fully one-fourth less than the receipts for April, which had reached 274,424 tons. Semi-finished steel accounted for much of the drop, although losses in sales of foreign made pig iron, steel bars, rods, angles, and plates and sheets also declined considerably.

### Luxemburg Production of Iron and Steel

LUXEMBURG, June 5.—On April 30, the furnaces in blast in Luxemburg numbered: all 6 at Esch/Alz; all 6 at Dudelange; 2 of the 3 at Dommeldange (A. R. B. E. D.); all 6 at Belval; Esch is at a standstill (Terres-Rouges); all 10 at Differdange; Rummelange is out (Hadir); at Rodange, 4 of the 5; at Steinfort, 2 of 3.

During April the production of pig iron for the Grand-Duchy amounted to 187,193 tons, including 183,938 tons basic iron, and 3255 tons cast iron.

Steel production for the same period totaled 167,143 tons, including 163,943 tons basic steel, 2921 tons open-hearth steel and 279 tons electric steel.

### Wickwire Spencer Concentration

The National Mfg. Co. division of the Wickwire Spencer Steel Co. will be moved from Worcester, Mass., to Clinton, Mass., this summer, following the company's policy of concentrating manufacturing to procure reduction in operating expenses. The large Wright division at Worcester, formerly the plant of the Wright Wire Co., has already been merged in the Clinton Wire Cloth Co. division. The National division will occupy space in one of the present buildings at Clinton. This plant manufactures kitchen ware and other wire goods and has about 200 employees. The business is an old one, having been established in 1834, and moved to its present location, 19 Union Street, in 1893.

### Canadian Iron and Steel Output Up in May

The production of pig iron in Canada in May was 63,204 gross tons, which compares with 60,065 tons for the month of April, and 63,932 tons for March. No foundry or malleable iron was made, the entire output being basic for the further use of reporting firms. Five furnaces were in blast at the end of May located as follows: British Empire Steel Corporation, Sydney, N. S., two; Algoma Steel Corporation, Sault Ste. Marie, Ont., two; Steel Co. of Canada, Ltd., Hamilton, Ont., one.

In May the production of steel ingots and castings in Canada advanced to 100,250 tons, or 13 per cent over the 88,355 tons produced in April. Although steel castings fell slightly to 1637 tons from the previous month's output of 1883 tons, this decline was more than made up by the advance in the tonnage of steel ingots, which rose from 86,472 tons in April, to 98,613 tons in May.

### Fire Destroys Wilfong Iron Works

The plant of the Millard F. Wilfong Iron Works Co., Fifty-second and Gray's Avenue, Philadelphia, was almost completely destroyed by fire on June 21. The office building was but slightly damaged and the company's records escaped injury. No estimate has been placed upon the loss, which was partly covered by insurance. Work in clearing up the wreckage was started immediately. Some of the heavy machinery may be salvaged, but cranes and other equipment were damaged beyond repair.

The fire started in the adjoining property which is owned by the city of Philadelphia and is used for the storage of paving material. Low water pressure is said to have handicapped the work of fighting the fire.

### American Imports of Manganese Ore

Estimates have been made by the United States Geological Survey of the importation of manganese ore in the last three years. They are rough approximations of the gross weight of ore based on the figures of manganese content reported by the Bureau of Foreign and Domestic Commerce. In gross tons the estimated data are as follows: 1922, 425,000 tons; 1923, 419,000 tons and 1924, 505,000 tons.



## MAY STRUCTURAL SALES

### Fabricators Report Drop—Five-Month Shipments Exceed Last Year's

WASHINGTON, June 22.—Bookings of fabricated structural steel totaled 171,506 tons in May, based on reports received by the Department of Commerce from 174 fabricators with a capacity of 249,315 tons, representing 69 per cent of capacity. April bookings, reported by 188 firms with a capacity of 253,720 tons, totaled 78 per cent of capacity. Computed tonnage booked in May was 200,100 tons, while shipments represented 78 per cent of capacity, the computed tonnage having been 226,200 tons.

For five months the computed tonnage of booking is 959,900 tons, against 962,800 tons last year. In shipments it is 1,017,900 tons, against 925,100 tons last year.

### Week's Awards of Fabricated Steel Total Close to 36,000 Tons

Awards of structural steel reported to THE IRON AGE for the past week totaled close to 36,000 tons, comparing favorably with several of the most active weeks of this year, although considerably less than the 59,000-ton total of the previous week. One of the large awards contributing to this week's total was 7100 tons for subway construction in New York.

Most of the business that has come up for bids in the past week calls for small tonnages. One of the large inquiries is for 2000 tons for the Lake State Bank, Chicago, and another calls for 3400 tons for subway construction in New York. Pending business for this week runs slightly larger than 20,000 tons. Awards include:

New York City, subway construction in Central Park West, two sections totaling 7100 tons of fabricated steel, to American Bridge Co.

Apartment building, Seventeenth and Locust Streets, Philadelphia, 2800 tons, to New York Shipbuilding Corporation.

Warehouse, Twelfth and Arch Streets, Philadelphia, 270 tons, to New York Shipbuilding Corporation.

Revised tonnage figures on the steel awarded by the Thompson-Starrett Co. to the American Bridge Co., reported last week, increase the total to 39,000 tons as follows: Equitable Trust Co., office building, Wall and Broad Streets, New York, 18,000 tons; Famous Players-Lasky theater and office building, Broadway and Forty-third Street, New York, 8000 tons; Gimbel Brothers store, Philadelphia, 13,000 tons.

Atlantic Coast Line, viaduct in South Carolina, 600 tons, to Virginia Bridge & Iron Works.

Theater, Elizabeth, N. J., 350 tons, to American Bridge Co.

Brooklyn Trust Co., bank building, Brooklyn, 300 tons, to McClintic-Marshall Co.

Church of the Holy Martyrs, New York, parochial school and church structure, 350 tons, to A. E. Norton, Inc.

Loft building, Prince, Crosby and Lafayette Streets, New York, 1900 tons, to Hay Foundry & Iron Works.

Apartment building, Fifth Avenue and Ninth Street, New York, 1850 tons, to Taylor-Fichter Steel Construction Co.

Parochial school, Dean Street, Brooklyn, 300 tons, to Easton Structural Steel Co.

Laundry, Danbury, Conn., 250 tons, to Porcupine Co.

Glenlton Print Works Co., Philippsdale, R. I., power house, 120 tons, to New England Structural Co.

Massachusetts General Hospital, Boston, addition, 150 tons, to New England Structural Co.

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., office building, 1300 tons, to American Bridge Co.

DuPont Engineering Co., Wilmington, Del., two 750,000 cu. ft. gas holders at Charleston, W. Va.; Utilities Power & Light Co., Chicago, a 150,000 cu. ft. gas holder at Austin, Minn.; Ansonia Copper & Iron Works Co., Cincinnati, gas holder of 3000 cu. ft. capacity at Terre Haute, Ind., and Gas Engineering Service Co., Battle Creek, Mich., for repairing a 40,000 cu. ft. gas holder at Plymouth, Mich., all to the Stacey Mfg. Co., Cincinnati.

Phillips Petroleum Co., 10 oil storage tanks, Shidler, Okla., 1500 tons, to Mount Cooper Boiler & Iron Works.

Kresge Co., office building, 26 South State Street, Chicago, 535 tons, to American Bridge Co.

Home Telephone & Telegraph Co., addition to Riverside

office building, Spokane, Wash., 534 tons, to Poole & McGonigle.

Y. M. C. A. building, Sixteenth and Locust Streets, St. Louis, 120 tons, to Stupp Brothers Bridge & Iron Co.

Illinois Central Railroad, two viaducts, Chicago, 1450 tons, to American Bridge Co.

Shearer Building, Detroit, 400 tons, to Russell Wheel & Foundry Co.

Port Terminal Commission, Baton Rouge, La., barge, 400 tons, to Midland Barge Co.

Petroleum Midway Co., 3 oil storage tanks in California, 1400 tons, to Llewellyn Iron Works.

Illinois Power & Light Co., gas holder, Decatur, Ill., 1500 tons, to Stacey Mfg. Co.

Allegheny Steel Co., Brackenridge, Pa., open-hearth building extension, 150 tons, to McClintic-Marshall Co.

Oakland-Alameda estuary tube, Oakland, Cal., 1150 tons sheet piling, to an Eastern mill.

Public Service Commission, Los Angeles, four buildings, 260 tons, to Llewellyn Iron Works.

Los Angeles County Hospital, Los Angeles, laundry, 200 tons, to Union Iron Works.

Oregon State Highway Commission, Portland, three bridges, 110 tons, to unnamed fabricator.

Bear River bridge, Sutter County, Cal., 100 tons, to United States Steel Products Co.

Shell Oil Co., station, Martinez, Cal., 100 tons, to Dyer Brothers.

Garfield junior high school, Los Angeles, 200 tons, to Baker Iron Works.

Santa Fe Railroad, power house, Grand Canyon, Ariz., 200 tons, to McClintic-Marshall Co.

Southern Pacific Co., San Francisco, 289 tons of plates, to an Eastern mill.

City of Los Angeles, 20 in. riveted steel pipe, 130 tons, to Los Angeles Mfg. Co.

Petroleum Midway Co., Los Angeles, three 80,000-bbl. tanks, 900 tons, to Western Pipe & Steel Co.

Washington State Highway Committee, Olympia, Wash., Everett-Marysville bridges, 200 tons sheet piling to an Eastern mill, through J. A. McEachern & Co.

Pan-American Petroleum & Transport Co., Los Angeles, 350 tons for stock, to an Eastern mill.

### Structural Projects Pending

Inquiries for fabricated steel work include the following:

Reading Railroad, bridge, 150 tons.

New York City, another section of subway, under St. Nicholas Avenue, 3400 tons; bids close July 3.

University of Pennsylvania, stadium, Philadelphia, previously reported, but figures revised from 1200 to 2500 tons.

Chesapeake & Ohio Railroad, bridge, 200 tons.

Theater, Atlantic City, N. J., 300 tons.

Art Museum, Harvard University, Cambridge, Mass., 410 tons.

Lake State Bank, Chicago, 2000 tons, Rapp & Rapp, architects.

South Park Commission, Thirty-first Street viaduct, Chicago, 700 tons, Ketter-Elliott Construction Co. low bidder.

Rice Hotel, Houston, Tex., 1400 tons, revised bids taken.

Shrine Temple, Des Moines, Iowa, 1000 tons.

Nurses' Home, Detroit, 800 tons.

Theater and office building, Detroit, 700 tons.

Forest Apartments, Detroit, addition, 320 tons.

Ford Motor Co., Detroit, building, 200 x 320 ft., 420 tons.

Consolidated Paper Co., storage building, Detroit, 140 tons.

Spokane, Wash., pipe line, 100 tons.

Melr-Frank Building, Portland, Ore., addition, 650 tons.

Apartment house, Washington Street, near Kearny, San Francisco, 100 tons.

Y. M. C. A., San Pedro, Cal., 141 tons.

Theater, Carthay Center, Los Angeles, 140 tons.

Oregon State Highway Commission, Portland, Ore., three bridges, 715 tons, bids close June 25.

Bascule bridge, One Hundredth Street, Chicago, 2000 tons, bids to be received July 14.

Morse Avenue Garage, Chicago, 450 tons.

Bank, San Jose, Cal., 2500 tons.

### Railroad Equipment

The Carnegie Steel Co. will place orders this week for the repair of 500 steel hopper cars.

The Hooker Electro-Chemical Co. has ordered five tank cars from the American Car & Foundry Co.

Madelra, Hill & Co. have ordered 25 coal mine cars from the American Car & Foundry Co.

The Texas & Pacific is inquiring for 500 gondola cars.

# Wages Under Shortened Workday

Bureau of Labor Statistics Shows That Increased Hourly  
Earnings More Than Offset Reduced  
Number of Hours Per Week

WASHINGTON, June 23.—The effect of the change to the 8-hr. day in the iron and steel industry is interestingly shown in a bulletin just issued by the Bureau of Labor Statistics, Department of Labor. This change brought about the first general reduction in working hours in the summer of 1923 and the survey made by the bureau plainly presents the extent to which the hours have been reduced. It covers the period from 1907 to 1924, and relates to ten departments of the industry.

The change in reduction of hours may be seen from the accompanying table, based on data in the report, showing the percentage of employees in a number of different departments who worked 72 hr. or more a week in 1922 as against 1924.

The report points out that employees in sheet and tin plate mills have been on an 8-hr. basis for many years and hours per week in these departments are subject to only slight changes from year to year. The 12-hr. turn, it states, had previously been practically eliminated from the puddling mill department also and scarcely any change in working time was noticed from 1922 to 1924.

The greater part of the data in the bulletin was obtained through personal visits of agents of the bureau to the several plants, the remainder being obtained from plants through correspondence. The figures for 1924 are based on actual pay-roll data. The period selected was Jan. 16 to Jan. 31, and the majority of the reports cover that period. In a few instances, when conditions in the plants in January were not representative, the reports were made for a normal period as near January as available. Of the 189 schedules obtained, 129 are for the last half of January, 37 are for some other period in January, 17 are for a period in February and four cover a period in March. The remaining two schedules were reported for a period in October, 1923.

## Increased Hourly Wages

"While full-time hours per week were decreased so materially," says the bulletin, "wage rates were adjusted so that employees received but slightly less pay for the shorter shifts than they had formerly received for working the longer hours. Later, substantial wage increases were effected in practically every department, so that the increase in hourly earnings has even more than offset the reduction in number of hours per week, and full-time earnings per week still show an increase in all departments except plate mills."

The report presents exhaustive details in tabular form showing earnings per hour of labor, and actual hours and earnings in one pay period in 1924 and compares them with preceding years back to and including 1907.

The first table presented in the bulletin shows for each department separately index numbers for average full-time hours per week, earnings per hour, and full-

time earnings per week, computed from the data for the principal productive occupations. The index number for each year is simply the per cent that the average for that year is of the average for 1913, taken as the base, and made equivalent to 100. This table shows that in the blast furnace department the full-time hours per week were the greatest in 1907, with an index number of 103, as against 75 in 1924. The earnings per hour were greatest in 1920, with an index number of 283 as against 254 in 1924, while the minimum was 83, applying to 1909. Full-time earnings per week were greatest in 1920, with an index number of 258, as against 190 in 1924 and the minimum of 85 in 1909. Relatively, the same condition largely applies to the other departments as to years, hours and earnings.

The second table here printed shows the per cent of increase or decrease in earnings per hour in the principal productive occupations as compared with 1914, 1920 and 1922.

While the customary number of full-time hours per week has been reduced to a large extent in practically every department of the industry, the bulletin states, the number of turns worked per week has been increased in several of them. In open-hearth furnaces 52 per cent of the employees, reported on in 1924, worked seven days per week, while an additional 32 per cent alternated or rotated regularly from six to seven days. This, it is pointed out, is the largest amount of 7-day work reported for any year shown.

Seven-day work in blast furnaces also increased, according to the report. In 1924, 80 per cent of the employees worked seven days, either all or part of the time, while in 1914 only 58 per cent worked that many days per week. Blooming mills also are recorded as showing more 7-day work in 1924 than any other year reported. The number of working days in Bessemer converter plants was at the highest point in 1920, although more turns per week were worked in 1924 than in any of the other three years dealt with in this instance—1914, 1915 and 1922.

## High Wages in Sheet and Tin Plate Mills

Taking up average hourly earnings in departments in 1924 by districts (Eastern, Pittsburgh, Great Lakes and Middle West and Southern), the bulletin says the highest hourly earnings are found in the sheet mills and tin plate mills, the rolling crews in these mills "working in three shifts at high speed and making exceptionally high hourly rates." The total for the two reporting districts in sheet mills was 80.9 cents per hour, the Pittsburgh rate being 82.9 cents, while the Great Lakes and Middle West rate was 78.4 cents. The tin plate rate for these two districts averaged 79.5 cents, the Pittsburgh rate being 84.3 cents and the Great Lakes and Middle West rate 69.7 cents.

Owing to the preponderance of common labor, or of occupations requiring very moderate skill, the lowest

Percentage of Employees Working 72-hr. per Week

	1922	1924
Blast furnaces .....	69	9
Bessemer converters .....	67	6
Open-hearth furnaces .....	64	7
Blooming mills .....	57	3
Plate mills .....	39	4
Bar mills .....	16	2

\*Only two employees were found in the Bessemer converting department working as many as 72 hr. per week in 1924, while 8 per cent of the employees in rail mills worked 72 hr. or more.

Earnings per Hour in 1924 Compared with Those of Other Years

	Per Cent of Increase (+) or Decrease (—) in:		
Department	1914	1920	1922
Blast furnaces .....	+152	—10	+23
Bessemer converters ..	+152	—6	+22
Open-hearth furnaces ..	+149	—5	+23
Puddling mills .....	+134	—14	+51
Blooming mills .....	+118	—5	+81
Bar mills .....	+115	—18	+20
Plate mills .....	+112	—20	+16
Sheet mills .....	+68	—26	+15
Tin-plate mills .....	+110	—15	+22



hourly average, 52 cents, was found in blast furnaces. The Pittsburgh and the Great Lakes and Middle West districts, the bulletin says, show considerably higher average hourly earnings than the Eastern and Southern districts, in all departments. This condition is attributed to the lower rates paid to common labor in the Eastern and the Southern districts.

"The proportion of common labor and of occupations requiring little skill in nearly every department was sufficient to affect materially the average for all occupations, even though there was in many cases much less variation between the rates of highly skilled occu-

pations in the several districts," the bulletin states.

The report covered a total of 74,104 employees and 189 plants for all departments in all districts. They included 36 blast furnaces, with 15,540 employees; 11 Bessemer converters, with 3457 employees; 26 open-hearth plants, with 11,611 employees; 17 puddling mills, with 3428 employees; 25 blooming mills; with 5649 employees; 13 plate mills, with 4234 employees; seven standard rail mills, with 3382 employees; 31 bar mills, with 6564 employees; 14 sheet mills, with 9690 employees, and nine tin plate mills, with 10,549 employees.

## TESTING ENGINEERS

### Annual Meeting at Atlantic City Opens Auspiciously—New Officers

ATLANTIC CITY, N. J., June 23.—For the first time in a number of years the first session of the twenty-eighth annual meeting of the American Society for Testing Materials was not held until this evening. These usually have occurred on Tuesday mornings. The session was devoted to wrought iron, cast iron, and corrosion and consisted principally of committee reports. Yesterday and today have been devoted to meetings of a large number of committees preparatory to the regular sessions which follow each day through Friday, June 26.

The steel and metal sessions occupy the first part of the week, the one on non-ferrous and metallography being scheduled for tomorrow morning, with the president's address, election of officers and the report of the executive committee at the annual meeting tomorrow evening. The steel session is scheduled for Thursday morning, June 25, at which papers on fatigue of metals will be presented. The important subject of research, together with one or two other subjects, will be discussed at the session, Thursday evening, June 25.

#### Report of Executive Committee

The annual report of the executive committee, which is to be presented tomorrow evening at the annual meeting, shows that the net increase in membership for the year ended with June, is 237, as compared with 241 for the corresponding period last year. The membership of the society at this time is 3718, as compared with 3481 a year ago. The 480 new members elected during the year compare favorably with the records of the two preceding years. This is stated to be due in a large part to the cooperation of the standing committees in their organized efforts to obtain new members. The present membership is divided as follows: Honorary members 3, members 3636, junior members 79. Among the 15 members lost by death during the year are A. O. Backert and Dr. Charles W. Burrows.

During the year the standing committees of the society have been quite active. Two new committees have been organized since the last annual meeting, namely, E-9 on correlation of research and D-17 on naval stores, bringing the total to 43 standing committees. Only four groups are not presenting reports this year. Five have submitted formal reports of progress, and reports from the remaining 34 are being given at the various sessions this year.

#### Group Meetings of Committees

Attention is called to the success of the plan of group meetings of standing committees which have been held during the year. In October, 1924, nine of the metals committees held a three-day series of meetings at the Bureau of Standards, Washington, and in March this year 11 metals committees and 12 non-metals committees held three-day group meetings in Philadelphia in successive weeks. Some of the details of the latter meeting were published in THE IRON AGE of March 26.

Three regular publications were issued during the

year: The *Proceedings* of 2306 pages, the book of A. S. T. M. Standards of 1230 pages, and the year book or membership list of 328 pages. The *Proceedings* a year ago contained only 1689 pages. There was also published in 1924 the book of A. S. T. M. Tentative Standards of 1763 pages, which is the only publication containing all of the tentative standards of the society. This brings the total number of bound publications, issued since the last annual meeting, but not including preprints and reprints, up to 4637 pages, compared with 3000 of the preceding year.

The annual statement of finances shows that the surplus on Dec. 31, 1924, was \$25,912.51, compared with \$37,133.03 on Dec. 31, 1923. Sales of the society publication have brought in \$20,514.30 this year, as against \$22,024.90 a year ago.

#### Research Activities

The report devotes a good deal of space to a consideration of the activities of committee E-9 on correlation of research, organized at the annual meeting last year, and states that the work is proceeding on a satisfactory basis. The first report of this committee, a preliminary reference to which was published in THE IRON AGE of June 18, is to be presented at the session on Thursday evening, and it shows that the committee has been considering the problems before it from a broad viewpoint. It has conducted a survey of the research activities now going on in the society's committees as the necessary first step in the study of existing agencies of the society for promotion of knowledge of materials and discussion of the question as to what new agencies, if any, are needed in the society for the development of this work. Committee E-9, however, is emphasized to be not a research committee in the sense of actually conducting research, but one expected to devise ways and means covering the whole question of research activities in the various committees.

#### The Dudley and Marburg Memorials

The report deals quite fully with two recommendations of the committee on correlation of research covering the proposed establishment of the annual medal in memory of Dr. Charles B. Dudley and an annual lecture in memory of Dr. Edgar Marburg. The stimulation of research in materials and the keeping before the members the fact that an important function of the society is the promotion of knowledge of engineering materials are the two principal aims inspiring this proposition. Some of the details were published in THE IRON AGE of May 7.

#### New Officers

New officers of the society who will be formally elected tomorrow evening are:

President—W. H. Fulweiler, chemical engineer, United Gas Improvement Co., Philadelphia.

Vice-President—H. F. Moore, professor of engineering materials, University of Illinois, Urbana, Ill.

Members of the executive committee—Louis Anderson, Jr., chemical engineer and chief chemist Alpha Portland Cement Co., Easton, Pa.; E. F. Kenney, metallurgical engineer Bethlehem Steel Co., Bethlehem, Pa.; T. D. Lynch, manager materials and process engineering department, Westinghouse Electric & Mfg. Co., Pittsburgh, and K. G. Mackenzie, consulting chemist, Texas Co., New York.



# Pessimism Features Many Reports

Few Signs of Activity in European Markets—  
Exchange Bothers—Syndicates  
Still Forming

(By Cablegram)

LONDON, ENGLAND, June 22.

**P**IG IRON is weak, on the absence of consumer demand and increasing supplies. Export inquiry is negligible, owing to cheaper offerings from the Continent, on depreciation of the franc and talk of further curtailment of output. Both foundry and hematite consumers are indisposed to commit themselves to forward action.

Foreign ore is dull. Bilbao Rubio is held nominally at 22s. (\$5.34) c.i.f. Tees.

Finished steel is deadly dull as to export market and there is keen competition among the makers to secure orders. There is more interest in the domestic department.

Tyne launchings in the first five months were 26 vessels aggregating 87,194 tons, against 29 vessels and 111,119 tons one year ago. One hundred seventeen vessels are lying idle.

## Sheets and Tin Plate

Tin plate is easier on bear merchant selling and sales by works anxious for orders. The price is now well below cost but in many cases foreign sheet bars are used. There is moderate inquiry, but a further curtailment of output is anticipated, unless the position improves.

Galvanized sheets are dull.

There is a revival in demand for thin black sheets for Japan and the market is firmer; 6 x 3 ft., 13's, 107 lb., now being quoted at £15 5s. to £15 15s. (3.31c. to 3.42c. per lb.).

## On the Continent of Europe

Continental position is disorganized by the Charleroi strike. Most Belgian makers of iron and steel products have withdrawn quotations. The political situation in

China is hampering trading in that quarter. Domestic consumers in Britain display little interest.

Negotiations looking to the formation of an international rail syndicate are still pending. In Germany, 15 out of 17 interested parties have signed up on the wire rod makers' syndicate. If the others are not in by June 30, the present signatures then become invalid.

## Growing Stagnation in British Industry Causes Much Concern

LONDON, ENGLAND, June 11.—The position of the iron and steel trades is become still more critical, and more men are being thrown out of work. Not only is this the case in iron and steel, but the coal trade situation is serious also. In Durham, alone, 78 out of 200 collieries are closed down and 40,000 out of 140,000 miners are idle. In addition, engineering employers are faced with labor troubles over wages and working hours. Another iron works is being disbanded, while three iron-ore companies are dismissing half their men.

It will thus be seen that the outlook for iron and steel in this country is far from bright. The production of pig iron has been curtailed by the damping of furnaces, but even now the rate of consumption is such that makers, particularly of hematite, cannot dispose of their large stocks. The export business in pig iron also is very dull, British iron being hardly competitive with that manufactured abroad.

Semi-finished steel is entirely dominated by the cheaper Continental product and nearly all the business with consumers here, particularly the sheet and re-rolling trades, is done in the latter commodity. Continental makers being able to sell billets, etc., de-

(Continued on page 1877)

British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' Works, with American equivalent figured at \$4.85 per £1, as follows:

	£1	1s.	to £1	1½s.	\$5.10	to \$5.22
Durham coke, del'd..	1	2			5.34	
Bilbao Rubio ore†..	1	2			18.95	
Cleveland No. 1 fdy..	3	18			17.74	
Cleveland No. 3 fdy..	3	13			17.50	
Cleveland No. 4 fdy..	3	12			17.25	
Cleveland No. 4 forge	3	11			18.10	
Cleveland basic .....	3	14½			18.95	
East Coast mixed....	3	18			24.06	
East Coast hematite..	4	19			75.33	
Ferromanganese .....	15	10			74.11	
*Ferromanganese .....	15	5			41.31	to 43.74
Rails, 60 lb. and up..	8	10	to 9	0	31.59	to 35.23
Billets .....	6	10	to 7	5		
Sheet and tin plate					32.20	to 34.02
bars, Welsh .....	6	12½	to 7	0	4.74	to 4.86
Tin plates, base box..	0	19½	to 1	0		
Ship plates .....	8	10	to 9	0	1.84	to 1.95
Boiler plates .....	12	10	to 13	0	2.71	to 2.82
Tees .....	8	10	to 9	0	1.84	to 1.95
Channels .....	7	15	to 8	5	1.68	to 1.79
Beams .....	7	10	to 8	0	1.63	to 1.73
Round bars, ¾ to 3 in.	9	0	to 9	10	1.95	to 2.06
Galv. sheets, 24 gage	16	0	to 16	5	2.47	to 2.53
Black sheets, 24 gage	11	10			2.49	
Black sheets, Japanese					3.31	
specifications .....	15	5			2.33	and 2.71*
Steel hoops .....	10	15	and 12	10*		
Cold rolled steel strip,					3.47	
20 gage .....	16	0				

\*Export price.  
†Ex-ship, Tees, nominal.

## Continental Prices, All F. O. B. Channel Ports

Foundry pig iron:(a)	£3	6s.	to £3	7s.	\$16.04	to \$16.28
Belgium .....	3	6	to 3	7	16.04	to 16.28
France .....	3	6	to 3	7	16.04	to 16.28
Luxemburg .....	3	6	to 3	7	16.04	to 16.28
Basic pig iron:(a)						
Belgium .....	3	6	to 3	7	16.04	to 16.28
France .....	3	6	to 3	7	16.04	to 16.28
Luxemburg .....	3	6	to 3	7	16.04	to 16.28
Billets:						
Belgium .....	4	19			24.06	
France .....	4	19			24.06	
Merchant bars:						C. per Lb.
Belgium .....	5	11			1.20	
Luxemburg .....	5	11			1.20	
France .....	5	11			1.20	
Joints (beams):						
Belgium .....	5	7			1.16	
Luxemburg .....	5	7			1.16	
France .....	5	7			1.16	
Angles:						
Belgium .....	5	18½	to 6	0	1.28	to 1.30
½-in. plates:						
Belgium .....	6	14			1.45	
Germany .....	6	14			1.45	
¾-in. ship plates:						
Luxemburg .....	6	14			1.45	
Belgium .....	6	14			1.45	

(a) Nominal.

# Iron and Steel Markets

## A STEADY DEMAND

### Volume of Business More Satisfactory Than Prices

#### No Marked Curtailment in Operations Ahead—Northern Iron More Stable

In the volume of business flowing to the mills the steel industry continues to make a better showing than in respect to prices. Sheets and wire products are \$1 to \$2 a ton lower this week, and in some markets plates and cold-rolled strip steel are less stable, while in the Central West there are indications of weakness in semi-finished steel.

The comparative steadiness of mill operations and the frequency and in some cases the urgency of current orders are still the marked feature of the situation. Shipments of rolled products are large, and for the first six months of the year are estimated at more than 2,000,000 tons in excess of those for the first half of 1924.

Assuming that steel ingot production in June has been nearly 70 per cent of capacity, the total for the first half of the year will be in excess of 22,000,000 tons or only 1,000,000 tons less than the remarkable record of the first half of 1923.

Though finished steel bookings are still less than shipments, a number of producers report orders at a better rate than in May or in the early part of June, and the indications are that the rate of production in July will show no marked falling off from that of June.

The Pittsburgh and Youngstown districts are keeping close to their operating schedules of the past few weeks, while at Chicago the Steel Corporation is producing at 80 per cent of capacity against 83 per cent in the previous week.

Sales of pig iron have fallen off somewhat, as was to be expected after the heavy movement of May and early June. At Pittsburgh, Cleveland and Chicago producers have secured good backlogs for the third quarter and some of them are asking 50c. a ton more than their recent low prices. Southern iron, however, which has been held at \$20 at Birmingham, is now \$19, or more in line with the recent course of the Northern market. Chicago sales since the middle of May are put at 300,000 to 350,000 tons. Output has been further curtailed in June, so that a more stable market is looked for in the immediate future, even though it be less active.

Chicago plate and sheet mills have found increasing pressure from mills farther East and in territory readily reached from Pittsburgh, Youngstown and Chicago the competition has been severe, prices of both products having receded \$1 to \$2 a ton in the past week.

The sheet bar price for the third quarter is likely to be determined this week. Producers thus far have talked \$35, while buyers have been centering on \$33.

Pipe bookings in the first half of the year, in contrast with those in other lines, have exceeded

shipments, in the case of important mills. While there has been a considerable decline in May and June, production on a large scale is assured for many weeks.

For the five months ended with May the sheet production of the country was equal to 92 per cent of the capacity, this extraordinary output accounting for much of the weakness of prices.

Structural steel orders for the first five months of 1925 totaled 959,900 tons, compared with 962,800 tons for the similar period in 1924, according to figures compiled by the Department of Commerce, a loss of 2900 tons. Awards in the past week again reached a substantial total, about 36,000 tons. At Chicago building activity shows some signs of tapering off.

Automobile companies are ordering steel more frequently than in the earlier months of the year. In spite of some slowing down, the car output this month promises to make a new June record and a number of builders will operate on a large scale in July.

The one car inquiry of the week is that of the Texas & Pacific for 500, and the Great Northern is in the market for 1000 underframes. Along with the cessation of car buying by the railroads there has been at Chicago some suspension of specifications on rail contracts. Meanwhile the railroads, in spite of their prodigious traffic, have a surplus of equipment.

The St. Louis Southwestern Railway is inquiring for 15,000 tons of 90-lb. rails for delivery in the next three months.

On the 25,000 tons of 80-lb. rails for the Government Railways of South Africa which a British mill took in competition with American rails, the reported price was close to \$32 a ton at mill, though on home orders the British price is about \$41 and the American price \$43.

## Pittsburgh

### Pig Iron and Scrap Higher but Steel Still Weak

PITTSBURGH, June 23.—If the price situation could be blotted out of the picture, the steel industry would have occasion for some satisfaction about today's market. Certainly the demand for steel is steady and persistent and in total volume has been at about the same rate now for fully five weeks. In the same period there has been only a trifling variation in the rate of ingot production in this and nearby districts and this would seem to denote a balancing between supply and demand. At this time last year the trend of demand and production was markedly downward and in July production of ingots was barely 40 per cent of capacity. There is no such prospect today, because the frequency and, indeed, the urgency of purchases plainly indicate the low state of consumers' stocks and in contrast with the conditions over the end of last year and the first quarter of this year, steel manufacturers today apparently are not producing in excess of their orders. Prices have been getting attention to the exclusion of all other figures in the steel market. The week has brought still lower prices for sheets and wire products and low prices are still coming out on tonnages of cold rolled strips that are attractive from



## A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics  
At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	June 23, 1925	June 16, 1925	May 26, 1925	June 24, 1924
No. 2X, Philadelphia...	\$21.26	\$21.26	\$21.26	\$21.26
No. 2, Valley furnace...	18.50	18.00	18.50	19.00
No. 2, Southern, Cin'tit...	24.05	24.05	24.05	23.05
No. 2, Birmingham, Ala.†	19.00	20.00	20.00	19.00
No. 2 foundry, Chicago*	20.50	20.00	20.50	20.00
Basic, del'd, eastern Pa.	21.50	21.50	21.50	21.00
Basic, Valley furnace...	18.00	18.00	18.25	19.00
Valley Bessemer del. P'gh	20.76	20.76	21.26	22.26
Malleable, Chicago*	20.50	20.00	20.50	20.00
Malleable, Valley	18.50	18.50	19.00	19.50
Gray forge, Pittsburgh...	19.76	19.26	19.76	20.76
L. S. charcoal, Chicago...	29.04	29.04	29.04	29.04
Ferromanganese, furnace...	115.00	115.00	115.00	107.50

### Rails, Billets, etc., Per Gross Ton:

O.-h. rails, heavy, at mill.	\$43.00	\$43.00	\$43.00	\$43.00
Bess. billets, Pittsburgh...	35.00	35.00	35.00	38.00
O.-h. billets, Pittsburgh...	35.00	35.00	35.00	38.00
O.-h. sheet bars, P'gh...	35.00	35.00	35.00	40.00
Forging billets, base, P'gh	40.00	40.00	40.00	43.00
O.-h. billets, Phila.	40.30	40.30	40.67	43.17
Wire rods, Pittsburgh...	45.00	46.00	46.00	48.00
Cents Cents Cents Cents				
Skelp, gr. steel, P'gh, lb.	1.90	1.90	2.00	2.20
Light rails at mill.	1.70	1.70	1.75	1.90

### Finished Iron and Steel:

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia...	2.22	2.22	2.22	2.42
Iron bars, Chicago...	2.00	2.00	2.05	2.20
Steel bars, Pittsburgh...	2.00	2.00	2.00	2.20
Steel bars, Chicago...	2.10	2.10	2.10	2.25
Steel bars, New York...	2.34	2.34	2.34	2.54
Tank plates, Pittsburgh...	1.90	1.90	2.00	2.15
Tank plates, Chicago...	2.14	2.20	2.20	2.35
Tank plates, New York...	2.14	2.14	2.24	2.34
Beams, Pittsburgh	2.00	2.00	2.00	2.20
Beams, Chicago	2.20	2.20	2.20	2.35
Beams, New York...	2.34	2.34	2.34	2.44
Steel hoops, Pittsburgh...	2.40	2.40	2.40	2.75

\*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Sheets, Nails and Wire,	June 23, 1925	June 16, 1925	May 26, 1925	June 24, 1924
Per Lb. to Large Buyers: Cents Cents Cents Cents				
Sheets, black, No. 28, P'gh	3.10	3.15	3.20	3.50
Sheets, black, No. 28, Chi-				
cago dist. mill.	3.20	3.25	3.40	...
Sheets, galv., No. 28, P'gh	4.15	4.25	4.25	4.75
Sheets, galv., No. 28, Chi-				
cago dist. mill.	4.25	4.35	4.50	...
Sheets, blue, 9 & 10, P'gh	2.30	2.30	2.40	2.75
Sheets, blue, 9 & 10, Chi-				
cago dist. mill.	2.35	2.35	2.50	...
Wire nails, Pittsburgh...	2.65	2.70	2.75	2.90
Wire nails, Chicago dist.				
mill	2.70	2.75	2.85	...
Plain wire, Pittsburgh...	2.45	2.50	2.50	2.65
Plain wire, Chicago dist.				
mill	2.55	2.60	2.60	...
Barbed wire, galv., P'gh...	3.40	3.45	3.45	3.70
Barbed wire, galv., Chi-				
cago dist. mill.	3.55	3.55	3.55	...
Tin plate, 100 lb. box, P'gh	\$5.50	\$5.50	\$5.50	\$5.50

### Old Material, Per Gross Ton:

Carwheels, Chicago	\$17.25	\$17.75	\$16.25	\$15.50
Carwheels, Philadelphia	17.00	17.00	17.00	17.00
Heavy steel scrap, P'gh...	17.50	17.00	17.00	16.50
Heavy steel scrap, Phila.	15.50	15.00	15.00	15.00
Heavy steel scrap, Ch'go...	15.50	15.75	15.50	13.75
No. 1 cast, Pittsburgh...	17.00	17.00	17.50	17.50
No. 1 cast, Philadelphia...	17.50	17.50	17.00	17.50
No. 1 cast, Ch'go (net ton)	17.50	17.50	17.50	16.50
No. 1 RR. wrot. Phila.	18.50	18.00	17.50	16.50
No. 1 RR. wrot. Ch'go (net)	14.50	15.00	14.00	11.50

### Coke, Connellsville,

Per Net Ton at Oven:

Furnace coke, prompt...	\$2.75	\$2.75	\$3.00	\$3.00
Foundry coke, prompt...	3.75	3.75	4.00	4.00

### Metals,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York...	13.75	13.75	12.62½	12.62½
Electrolytic copper, refinery	13.50	13.50	13.37½	12.25
Zinc, St. Louis	7.00	7.02½	7.07½	6.75
Zinc, New York	7.35	7.37½	7.42½	6.10
Lead, St. Louis	7.90	8.00	8.05	6.80
Lead, New York	8.25	8.35	8.40	7.00
Tin (Strait), New York...	54.50	56.25	55.75	43.12½
Antimony (Asiatic), N. Y.	16.50	16.50	17.00	8.50

## THE IRON AGE Composite Prices

June 23, 1925, Finished Steel, 2.424c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets. These products constitute 88 per cent of the United States output of finished steel.	{	June 16, 1925, 2.429c.
		May 26, 1925, 2.460c.
		June 24, 1924, 2.603c.
		10-year pre-war average, 1.689c.

June 23, 1925, Pig Iron, \$19.13 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham.	{	June 16, 1925, \$19.21
		May 26, 1925, 19.43
		June 24, 1924, 19.54
		10-year pre-war average, 15.73

High				Low			
1923	1924	1925		1925	1924	1923	
2.824c, April 24	2.789c, Jan. 15	2.560c, Jan. 6	Finished Steel	2.424c, June 23	2.460c, Oct. 14	2.446c, Jan. 2	
\$30.86, March 20	\$22.88, Feb. 26	\$22.50, Jan. 13	Pig Iron	\$19.13, June 23	\$19.21, Nov. 3	\$20.77, Nov. 29	

the mill standpoint. The bar market is giving a good account of itself, but on the other major products the price situation is soft, especially on business outside of the Pittsburgh area. There are indications of a weaker market in semi-finished steel. Sheet bar makers want \$35 but consumers feel that \$33 is all that they should pay.

The recent good sized turnover of foundry pig iron seems to have strengthened the position of producers and, while sales are smaller, an advance of 50c. a ton has been growing more readily obtainable. The low price of coke is favorable to pig iron producing costs, but also is a factor in keeping down the price ideas of

pig iron consumers. Heavy steel scrap has retrieved a recent drop of 50c. a ton as a result of fair sized purchases by Ohio Valley steel makers.

Pig Iron.—Sales have shrunk considerably in volume in the past week, but this reflects no lack of interest on the part of melters, but rather that producers of foundry iron generally are holding to \$18.50, Valley furnace, for the base grade and are unwilling to consider less. A number of small lot sales have been made at that price and seemingly that is now the market's minimum quotation. With only 6 out of the 23 merchant furnaces in this and nearby districts in production, and one of these likely to be blown out in the next few days, the produc-

tion of merchant iron is down to a very low rate. There are no signs that furnaces now idle will soon get going and shipments, therefore, are largely drafts upon existing stocks on furnace yards. There is very little activity in the steel making grades of iron. A sale of 1000 tons of basic iron is noted at \$18, Valley furnace and 3000 tons of Bessemer iron is embraced in an inquiry which, it is expected, will be closed in a few days at \$19, Valley furnace. There is before the market an inquiry for 1000 tons of foundry iron from the Elliott Co., Jeanette, Pa., and the National Radiator Co. wants 2000 tons of foundry iron for its New Castle, Pa., plant for delivery over the last half of the year. There has been a loss of five active furnaces in the past month in this and nearby districts, leaving 68 in production and 67 out.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being \$1.76 per gross ton:

Basic .....	\$18.00
Bessemer .....	19.00
Gray forge .....	18.00
No. 2 foundry .....	18.50
No. 3 foundry .....	18.00
Malleable .....	18.50
Low phosphorus, copper free.....	27.75 to 28.00

**Ferroalloys.**—Prices are holding well, but there is not much activity. Small lots of ferromanganese are being sold for early delivery at the full price, but consumers are not yet seriously interested in their future requirements. Most of them have a stock and as the demand for steel is largely hand-to-mouth, forward scheduling is impossible and consequently the tendency is to buy raw materials sparingly. Some expiring contracts for spiegeleisen are being extended at or about today's prices. Prices are given on page 1873.

**Semi-Finished Steel.**—Evidence of a weaker market is found in lower prices for billets and slabs in the Youngstown district, where makers have gone to \$33.50 to secure a few small orders. Pittsburgh mills still are quoting \$35 and claim that they have not revised contract prices or equaled lower quotations on new business. The Pittsburgh mill quotations on sheet bars also is \$35 and Youngstown makers also claim that as the price, not only on current inquiries, but on third quarter tonnages. Negotiations for third quarter sheet bar tonnages are in progress, with buyers offering \$33 and mills asking \$35. There should be a decision in the case before another week. In a broad way the whole market is quiet in point of sales and prices are not very definite. The decline in wire products has extended to rods, which now are \$45, base, Pittsburgh or Cleveland, and \$48 at Chicago district mills. In the lack of important business 1.90c. to 2c. is a fair appraisal of the skelp market. Prices are given on page 1873.

**Plates.**—Prices above 1.90c., base, Pittsburgh, have pretty well disappeared locally, but so far nothing lower has been done in this immediate territory. There are no inquiries of a size to tempt concessions and as outside mills are not disposed to ship to or toward Pittsburgh, there is no real competition. Pittsburgh mills would have to go to about 1.75c., Pittsburgh, to get business in the Middle West, or along the Atlantic Seaboard, and there is no doubt that business is going on the books at that figure. Delivered prices over the Eastern half of the country are much the same regardless of shipping points and the variation now is in mill, rather than in delivered prices. The mills know the freight charges to all consuming points from all producing points and prices to consumers are based on this knowledge. Prices are given on page 1872.

**Sheets.**—The price situation still is unsettled, with blue annealed sheets alone showing some semblance of steadiness. That grade here is holding fairly well at 2.30c., base, despite reports from other districts of a price of 2.25c. On black sheets, 3.10c., base, has become common on worth-while tonnages, while galvanized sheets have receded to 4.15c. and as low as 4.10c. is reported on automobile body sheets, although some makers report sales with no dispute on the part of buyers at 4.25c. and explain the lower price as referring to full pickled, rather than full-finished automobile sheets. There is a fairly good business, but with prices

so uncertain, buyers are placing only their known requirements. The market still suffers from overproduction and the efforts of some producers to maintain a higher rate of mill operation than the demand warrants. Prices are given on page 1872.

**Steel and Iron Bars.**—The Pittsburgh district market for steel bars is holding well at 2c., base; indeed, the makers have had more success in maintaining bar prices than those for the other heavy products. This is due probably to the fact that they can go farther afield without encountering the competition met in plates and shapes. Business in bars is steady, even though of small individual tonnages and for such early deliveries as to make difficult mill scheduling more than a week ahead. Refined iron bars are steady in price and in fair demand. Prices are given on page 1872.

**Structural Shapes.**—So far as the Pittsburgh district is concerned, the market still is 2c., base, Pittsburgh, but as this district is not providing very much tonnage for the mills here, that price is probably well above the order book average. Going outside the area where they have the advantage of freight, Pittsburgh mills have to absorb the freight, and this brings down the net mill price. This is not a new condition; for several years local mills have had to yield in shipping West, and only in rush times has the Pittsburgh price plus full freight to Eastern points been obtainable. The passing of Pittsburgh as a sole basing point has localized the markets and the Pittsburgh shape price is merely that for the Pittsburgh area. Structural shops here are busy on old business, but are not getting new orders as rapidly as old ones are completed. Prices are given on page 1872.

**Bolts, Nuts and Rivets.**—Continued steadiness in prices of bolts and nuts appears to be inspiring confidence on the part of consumers, and while business is not very brisk, it has been better so far this month than at the same period last month. Third quarter prices on rivets have been announced. They are \$2.50, base, per 100 lb., Pittsburgh, for the large rivets and 70 and 10 per cent off list for small ones. Lower prices probably still can be done on attractive orders, especially for early delivery. Prices and discounts are given on page 1872.

**Tin Plate.**—From the standpoint of mill operations and shipments, this product still occupies a favorable position in the steel situation. Specifications on contracts are coming along without urging and some consumers are actually pressing for delivery, since the outlook for the packing crops improves as the summer progresses. It was believed that the pea crop in Wisconsin would be much curtailed this year owing to dry weather, but there have been heavy rains there recently. Of the 19,000,000 cases of peas packed last year, that State accounted for 10,000,000 cases. The outlook is for a huge pack of green corn. Some rush orders for tin plate from California are explained by the requirements for fish rather than fruits and vegetables. Packers on the Pacific Coast now are putting up large quantities of sardines and competing successfully in the Orient with the Norwegian product. There is no evidence that there will not be enough tin plate for all requirements, although the weather still is having some effect upon production. The common price still is \$5.50 per base box, Pittsburgh, for standard cokes for domestic account, but there are occasional deviations.

**Wire Products.**—There is a fair run of small lot orders for early delivery, but the total is not sufficient to provide more than 50 per cent engagement of capacity. Mills anxious for a more economical operation are making prices calculated to inspire purchases, and \$2.65, base, per keg, Pittsburgh, lately has become the common price on bright nails, while bright wire and other products, which hitherto have resisted the weakness in nails, have yielded, with bright wire now quoted at \$2.45, base, per 100 lb., a drop of \$1 per ton. Preservation of accounts is important with companies which have been disposed to hold to recent prices. Prices are given on page 1872.



**Rails and Track Supplies.**—The report here is that the Louisville & Nashville Railroad has placed the 7500 kegs of spikes it recently inquired for with the Tennessee Coal, Iron & Railroad Co. Track supplies are moving slowly with local makers, who, however, are holding to their recent prices. Light rails are slow and prices are almost indeterminate. There is a fairly steady movement on standard rails on old orders. Prices are given on page 1872.

**Cold Rolled Strips.**—Makers in this district continue to regard 3.75c., base, Pittsburgh, as the third quarter contract price and also the market on ordinary tonnages. Much lower prices, however, are noted, but as a rule they refer to large tonnages running to a few sizes and consequently are attractive from a rolling mill standpoint. Competition for such business is sharp.

**Cold-Finished Steel Bars and Shafting.**—July specifications on contracts are well up to expectations and beyond them in some instances, since it was generally expected that the automobile parts makers would not want as much steel next month as in June. Some recession is observed in the output of automobiles, but it has not been as much as many feared. Makers expect good business from the agricultural implement manufacturers in the last half of this year, as present signs are in the direction of a big business in implements in 1926. The market holds at 2.60c., base, Pittsburgh, on ordinary tonnages.

**Hot Rolled Flats.**—The market is holding at 2.40c., base, for material narrower than 6 in. and at 2.20c., base, for widths from 6 to 12 in. Demand is good since automobile production still is high and automobiles provide an important outlet for strips. Prices are given on page 1872.

**Tubular Goods.**—There is general expression of satisfaction over pipe business. Orders and specifications in merchant pipe are somewhat above the average for this time of year and the consumption of oil is so heavy as to encourage drilling in a larger number of fields than recently were being tapped. This means a good demand for well goods and also for line pipe to tie up producing fields with refineries, the past week's awards including 40 miles of 12-in. and 15 miles of 10-in. plain end pipe for Wyoming, by the New York Oil & Gas Co., the order amounting to 6000 tons. The Mission Oil Co. has placed 73 miles of 12-in. pipe for a line to run from Webb to McMullen counties in Texas, to connect up with the line of the Southern Natural Gas Co. Boiler tube business is only fair at best, but a steady demand for mechanical tubing still is coming from the automobile builders. Mill prices are holding well, but there is still some weakness in secondary prices of merchant pipe. Discounts are given on page 1872.

**Coke and Coal.**—The beehive oven coke market still is easy. There is almost no market for spot furnace coke, since all of the blast furnaces now in production are covered by contracts and there is always some supply as a result of efforts of producers to keep their plants partially engaged. Prices range from \$2.75 to \$2.85 per net ton at ovens. Spot foundry coke holds at \$3.75 to \$4.25 for standard hand drawn 72-hr. coke, but sales suffer from the fact that a good many foundries are using selected furnace coke which is being offered at much lower prices. It is reported that operators of union mines have reached agreements with the men calling for a resumption of operation on the basis of the November, 1917, scale of wages, and there is an impression that more union coal soon will be coming upon the market. Prices are given on page 1873.

**Old Material.**—The market on the open hearth grades has stiffened slightly in the past week as a result of a good-sized purchase by Weirton Steel Co., which is credited with having taken 22,000 tons of heavy melting steel, compressed and bundled sheets. The prices were \$17.50, \$18.50 and \$15.50, respectively. Another down river steel manufacturer yesterday closed for a tonnage of heavy melting steel, paying \$18, and the market on that grade is now quotable at \$17.50 to \$18, the recent recession thus having been restored. It is a rather striking characteristic of this market that when it looks as if it were going

down, one consumer or another comes in to stem the tendency. In other directions the market is quiet, with little or no change in prices. The Baltimore & Ohio Railroad will take bids until noon, June 29, on 16,425 gross tons of scrap.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

Per Gross Ton	
Heavy melting steel.....	\$17.50 to \$18.00
No. 1 cast, cupola size.....	17.00 to 17.50
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.....	18.00 to 19.00
Compressed sheet steel.....	16.50
Bundled sheets, sides and ends.....	15.50
Railroad knuckles and couplers.....	19.50 to 20.00
Railroad coil and leaf springs.....	19.50 to 20.00
Low phosphorus blooms and billet ends.....	22.00 to 22.50
Low phosphorus plate and other material.....	21.00 to 21.50
Railroad malleable.....	17.00 to 17.50
Steel car axles.....	20.00 to 20.50
Cast iron wheels.....	17.00 to 17.50
Roller steel wheels.....	19.50 to 20.00
Machine shop turnings.....	13.00 to 13.50
Short shoveling turnings.....	13.00 to 13.50
Sheet bar crops.....	20.00 to 20.50
Heavy steel axle turnings.....	16.50 to 17.00
Short mixed borings and turnings.....	12.50 to 13.00
Heavy breakable cast.....	15.00 to 15.50
Stove plate.....	13.50 to 14.00
Cast iron borings.....	13.00 to 13.50
No. 1 railroad wrought.....	14.00 to 14.50
No. 2 railroad wrought.....	17.00 to 17.50

## Look for Better Than 60 Per Cent Operations Through August

YOUNGSTOWN, June 23.—Active steel ingot production declined this week in the Mahoning Valley to a rate of 65 per cent, comparing with a production rate of 75 per cent in finishing departments, and indicating that steel makers are in some cases using stock. Ingot output of the Youngstown Sheet & Tube Co. is at 55 per cent. Its No. 10 tube mill is inactive for repairs.

Sheet mill schedules show three more mills active than the preceding week, and tonnage output shows some gain. Ninety-six sheet units were scheduled to operate beginning the Sunday midnight shift. Independent tin mill operations are being maintained at 85 per cent.

Following installation of electric drives in the Haselton sheet mill plant of the Sharon Steel Hoop Co., four mills resumed this week. The Trumbull Steel Co. is operating its finishing mills at Warren at a rate close to normal. Its No. 32 sheet mill is down for repairs, while several tin mills are also idle.

The Sheet & Tube company is operating its rod mill on a three-shift basis. The Republic Iron & Steel Co. has accelerated merchant steel bar production this week, operating five mills, including its 14-16 in. unit.

Strip mill capacity is active at 80 per cent and plate mills at 65 per cent.

In this district the Carnegie Steel Co. is maintaining four blast furnaces in action, of six at the Ohio works; 75 per cent steel ingot output and rolling mills at 80 per cent.

Steel makers are hopeful of maintaining production during July and August in excess of 60 per cent, and believe this possible in view of some recent betterment in buying, affecting the lighter steel products principally.

Steel fabricating interests in the Youngstown district are maintaining their plants at an operating rate close to 100 per cent. Boiler and tank makers and car repair interests are active at a rate close to normal. The high operating rate of such interests indicates a liberal consumption of such steel products as sheets, plates, steel bars, wire rods.

At Warren, the American Puddled Iron Corporation is maintaining four mechanical puddlers, its complete complement, in action.

The Twin Cities Foundrymen's Association held a group exhibit at the Northwest Industrial Exposition, held at the Overland Building, Midway, Minneapolis, during the week commencing June 8. Twenty-eight foundries in Minneapolis and St. Paul were represented.

## Chicago

### Steel Production and Prices Decline but Bookings Gain

CHICAGO, June 23.—The week brought another decline in steel output in this district, the operations of the leading interest having receded from 83 to less than 80 per cent of ingot capacity. At the same time the blowing out of one stack each at Gary and South Chicago reduced the number of active steel works blast furnaces to 24 out of a total of 35 in this district. Although not yet equal to shipments, bookings showed a gain over those of the previous week.

In view of the absence of railroad car buying and the fact that current orders are of a miscellaneous character, consisting almost exclusively of small tonnages for early shipment, the betterment was particularly encouraging. So long as satisfactory deliveries are available from the mills it is probable that the policy of buying from hand to mouth will be adhered to. Many small orders which would ordinarily be bought from warehouses are now finding their way to mill books. The surprising fact is that the aggregate of these small tonnages is so large. In fact, one of the smaller producers is booking as much as it is producing, but without finding it possible to accumulate any back log.

Tonnage coming from the railroads is disappointing. Car buying has ceased and in some instances large roads have discontinued specifying against their rail contracts.

The future of prices in this territory is apparently dependent upon the severity of competition from Ohio and Pittsburgh district mills. As yet there are no signs of any relaxation in the pressure for business in this territory on the part of outside producers. Plate prices have suffered, and black and galvanized sheets have again declined. Wire nails have dropped to \$2.65.

The pig iron market alone shows signs of stability after a protracted decline which commenced at the beginning of this quarter.

**Pig Iron.**—After a decline of \$4 a ton which commenced late in March, pig iron shows signs of stability. Although there was no concentration of buying, such as occurred at the time of the election, orders placed since the middle of May have steadily accumulated into a large tonnage, estimated at between 300,000 and 350,000 tons. Merchant furnaces in this district are now fortified with commitments which should assure the operation of the stacks now active through the third quarter. There is no longer the same incentive to obtain business that existed when producers were anxious to build up a backlog of forward business. If the volume of new business is declining and inquiries are fewer, it is because so many melters have already contracted for their needs. There is at present no immediate prospect of large offerings of merchant iron from steel works stacks, although a protracted decline in steel output through the summer might again make them factors in the market. On the other hand, one steel interest which sells merchant iron may be forced to blow out a furnace for relining and another has been having difficulty with a furnace which may not yield to temporary repairs. While no unusual tonnages of iron have been placed during the week, no business has gone at less than \$20.50, base Chicago furnace, for delivery in this district. In Indiana, Michigan, southern Illinois and other sections, where outside competition is encountered, lower base prices have been named. Both of the Wisconsin producers are quoting \$20.50, base furnace, so that buyers in that State are no longer paying on the basis of the Chicago price plus the freight from this city. Current inquiries include 1500 tons of foundry iron and 1500 tons of foundry and malleable for Chicago users, 750 tons of foundry for a local melter and 200 tons of malleable for a Michigan plant. A Wisconsin melter has closed for 1000 tons of foundry for last half. Another Wisconsin user is inquiring for 200 tons of low phosphorus for prompt delivery. Sil-

very is weak with few sales. Southern iron for barge and rail delivery has been sold at as low as \$22.18, delivered.

Quotations on Northern foundry, high phosphorus, malleable and basic irons are f.o.b. local furnaces and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards.

Northern No. 2 foundry, sil. 1.75 to 2.25 .....	\$20.50
Northern No. 1 foundry, sil. 2.25 to 2.75 .....	21.00
Malleable, not over 2.25 sil. ....	20.50
Basic .....	20.00 to 20.50
High phosphorus .....	20.50
High Superior charcoal, averaging sil. 1.50, delivered at Chicago .....	29.04
Southern No. 2 (barge and rail) ..	22.18 to 22.68
Low phos., sil. 1 to 2 per cent, copper free .....	31.79
Silvery, sil. 8 per cent. ....	29.79
Electric ferrosilicon, 14 to 16 per cent .....	43.42

**Ferroalloys.**—Outside of an inquiry for a carload of spiegeleisen the market is devoid of activity.

We quote 80 per cent ferromanganese, \$122.56, delivered; 50 per cent ferrosilicon for 1925 delivery, \$85, delivered; spiegeleisen, 18 to 22 per cent, \$38.04 to \$39.04, delivered.

**Semi-finished Steel.**—Billets and sheet bars are quoted at \$35, base Chicago, but no recent sales are reported.

**Bars.**—New business in soft steel bars continues to fall short of shipments, notwithstanding a slight gain over the bookings of the previous week. Orders, while individually small, are more numerous, indicating that consumers' stocks are in need of replenishment. So long as early deliveries are available from the mills, however, the present policy of hand-to-mouth buying is likely to be continued. Specifications from the automotive and farm equipment industries are still in good volume. Prices are steady at 2.10c., Chicago. Demand for bar iron is expected to improve in July after the railroads have completed their fiscal years. Their effort at the moment is to keep expenditures down to the minimum. There has been no further change in the prices of bar iron or of rail steel bars.

Mill prices are: Mild steel bars, 2.10c.; common bar iron, 2c. to 2.10c., Chicago; rail steel, 2c. to 2.10c., Chicago mill.

Jobbers quote 3c. for steel bars out of warehouse. The warehouse quotations on cold-rolled steel bars and shafting are 3.60c. for rounds and hexagons and 4.10c. for flats and squares; 4.15c. for hoops and 3.65c. for bands.

Jobbers quote hard and medium deformed steel bars at 2.60c.

**Plates.**—Pressure of outside mills seeking business in this territory is increasingly severe, and prices have suffered. Tank plates are being offered at as low as 1.80c., base Pittsburgh, or 2.14c., delivered Chicago. Although local mills continue to book some business at 2.20c., Chicago, they are meeting competition from the East wherever they encounter it. At Minneapolis and St. Paul 2.14c., delivered, has been done on plates for Lake and rail shipment from the East. In the St. Louis district local mills have been forced to go as low as 2c., Chicago, in order to compete with Pittsburgh district producers. There continues to be some oil storage tank construction. The Phillips Petroleum Co. has placed ten tanks, 1500 tons, for an Oklahoma location with the Mount Cooper Boiler & Iron Works.

The mill quotation is 2.14c. to 2.20c., Chicago. Jobbers quote 3.10c. for plate out of stock.

**Structural Material.**—Fabricating awards have declined, but a large amount of new work continues to come up for bids. Competition among fabricators is unabated. The low bid on 700 tons for the Thirty-first Street Viaduct, Chicago, to be built for the South Park Commission, was less than \$86, delivered. The recent award of 3500 tons to the Duffin Iron Works for a municipal auditorium, Minneapolis, is being contested before the city council on behalf of a Minneapolis fabricator. Plain material prices are unchanged.

The mill quotation on plain material is 2.20c., Chicago. Jobbers quote 3.10c. for plain material out of warehouse.



**Cast Iron Pipe.**—Pipe makers are entering their dull season and, fortified with a comfortable backlog, some of them have adopted a firmer attitude on prices. One maker has advanced to \$41 and another to \$42, base Birmingham, for 6-in. and larger. Kenosha, Wis., has awarded 240 tons to the National Cast Iron Pipe Co. The United States Cast Iron Pipe & Foundry Co. will supply 350 tons for Lake Forest, Ill. Chicago will take bids June 26 on 1140 tons of 8-in. Minneapolis will receive tenders June 29 on 2000 tons of 6, 8, 12 and 16-in. Detroit took figures yesterday on 300 tons of high-pressure pipe and 113 tons of fittings and special castings. Oconomowoc, Wis., placed 100 tons with the American Cast Iron Pipe Co.

We quote per net ton, f.o.b. Chicago, as follows:  
Water pipe, 4-in., \$51.70 to \$52.20; 6-in. and over, \$47.70 to \$48.20; Class A and gas pipe, \$4 extra.

**Bolts, Nuts and Rivets.**—In the aggregate, specifications for bolts and nuts are only fair, but discounts appear to be holding. On large rivets \$2.60 per 100 lb. is an increasingly common quotation, although sellers have not yet given up their effort to maintain a price of \$2.65. On small rivets prices range from 70 and 10 and 5 off to 70 and 10 off.

Jobbers quote structural rivets, 3.50c.; boiler rivets, 3.70c.; machine bolts up to  $\frac{3}{4}$  x 4 in., 55 per cent off; larger sizes, 55 off; carriage bolts up to  $\frac{3}{4}$  x 4 in., 50 off; larger sizes, 50 off; hot pressed nuts, squares, tapped or blank, \$3.50 off; hot-pressed nuts, hexagons, tapped or blank, \$4 off; coach or lag screws, 60 per cent off.

**Rails and Track Supplies.**—Rail mill operations have been adversely affected by the failure of some of the large roads to specify against their contracts. The Illinois Central has ordered 4000 tons of tie plates from the Sellers Mfg. Co., Chicago. A road with headquarters in St. Louis is inquiring for 12,000 to 15,000 tons of rails. Most orders and inquiries for track supplies are confined to small lots for current requirements. A local producer has booked 500 tons of light rails at 1.90c., mill. This is the first transaction of consequence in many weeks.

Standard Bessemer and open-hearth rails, \$43; light rails, rolled from billets, 1.80c. to 1.90c., f.o.b. maker's mill.

Standard railroad spikes, 2.90c. to 3c. mill; track bolts with square nuts, 3.90c. to 4c. mill; steel tie plates, 2.35c., f.o.b. mill; angle bars, 2.75c., f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.55c. base, and track bolts, 4.55c. base.

**Sheets.**—Pressure for business on the part of producers east of this district is still severe and prices have again suffered. Blue annealed alone is commencing to show signs of stability. Black and galvanized, however, have gone to new low levels, black ranging from 3.20c. to 3.30c., base, Western mill, and galvanized from 4.25c. to 4.35c. The leading Western independent is operating 15 out of 25 hot mills.

Chicago delivered prices from mill are 3.25c. to 3.35c. for No. 28 black, 2.40c. to 2.50c. for No. 10 blue annealed and 4.30c. to 4.40c. for No. 28 galvanized. Delivered prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than the Chicago delivered prices.

Jobbers quote f.o.b. Chicago: 3.50c. base for blue annealed, 4c. base for black, and 5c. base for galvanized.

**Wire Products.**—Orders are more numerous, and there has been an actual gain in the aggregate tonnage booked, but prices are still exceedingly weak. On nails \$2.75, delivered Chicago, or \$2.70, f.o.b. Western mill, has been done, and on bright plain wire \$2.50, delivered Chicago, or the equivalent of \$2.50, Western mill, is a rather common quotation. In fact, as low as \$2.45, Chicago district mill, has been done. Cement coated nails are weak at \$2, district mill. Mill operations are 50 to 55 per cent, but mill stocks are being reduced; in other words, shipments are in excess of output.

We quote warehouse prices f.o.b. Chicago: No. 8 black annealed wire, \$3.05 per 100 lb.; common wire nails, \$3.15 per keg; cement coated nails, \$2.45.

**Hot Rolled Strips.**—Prices are unchanged at 2.50c. for 6-in. and narrower and at 2.40c. for wider than 6 in., but concessions below the latter price have been made.

**Cold Rolled Strips.**—Prices range from 3.80c. to 3.90c., Chicago, on ordinary tonnages, but on large tonnages concessions of \$5 a ton are reported.

**Warehouse Prices.**—Local jobbers have reduced cold rolled steel bars and shafting \$4 a ton to 3.60c. for rounds and hexagons and to 4.10c. for flats and squares. Cold rolled strip and flat wire has been reduced \$5 a ton from 6.35c. to 6.10c. per lb., Chicago warehouse.

**Reinforcing Bars.**—Building activity, while in good volume, is showing some signs of tapering off, although indications in that direction are as yet by no means conclusive. A considerable percentage of recent lettings have called for rail steel bars. Lettings include:

Thornton Township High School, Harvey, Ill., 100 tons of rail steel, to Calumet Steel Co.

Peoples Store, Pullman, Ill., 100 tons of rail steel, to Calumet Steel Co.

Reservoir, Quincy, Ill., 300 tons, to Kalman Steel Co.

Theater, store and dance hall, Hammond, Ind., 200 tons, to Olney J. Dean & Co.

Mercyville Hospital, North Aurora, Ill., 130 tons, to Kalman Steel Co.

Rosen Building, Chicago, 120 tons, to Barton Spider Web System Co.

Minnesota State Highway No. 3, 150 tons, to Cowin & Co.

Minnesota State highway work, 125 tons, to Kalman Steel Co.

Leicht Storage & Transfer Co., warehouse at Green Bay, Wis., 100 tons, to Concrete Engineering Co.

Grand View Hospital, addition, La Crosse, Wis., 125 tons, to Concrete Steel Co.

Pending work includes:

Northern Pacific Railway, St. Paul, 400 tons.

Adams Street viaduct at Chicago Union Station, 400 tons, bids to be in June 29.

High school, Princeton, Ill., 100 tons.

Store and office building, Niles, Mich., 100 tons.

Hotel Astor addition, Milwaukee, 300 tons.

Wisconsin State Fair Park, grandstand addition, Milwaukee, 125 tons.

Eagles' Club, Milwaukee, 100 tons.

**Old Material.**—With no sustaining influence emanating from either seller or buyer, prices have again slumped 25c. to 50c. a ton on most grades. An independent mill, which bought from 40,000 to 50,000 tons of heavy melting during the past two weeks, commencing with a price of \$16.50 and concluding with \$16, delivered, has withdrawn from the market. Moreover, further purchases by this interest are not likely to be heavy in view of poor production prospects. Railroad offerings include the Burlington, 6000 tons; the Grand Trunk, 1000 tons; the St. Paul, 400 tons.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Iron rails .....	\$17.00 to \$17.50
Cast iron car wheels .....	17.25 to 17.75
Relaying rails, 56 and 60 lb. ....	25.00 to 26.00
Relaying rails, 65 lb. and heavier ..	26.00 to 31.00
Forged steel car wheels .....	19.00 to 19.50
Railroad tires, charging box size ..	19.00 to 19.50
Railroad leaf springs, cut apart. ....	19.00 to 19.50
Rails for rolling .....	17.50 to 18.00
Steel rails, less than 3 ft. ....	18.00 to 18.50
Heavy melting steel .....	15.50 to 16.00
Frogs, switches and guards cut apart .....	16.25 to 16.75
Shoveling steel .....	15.25 to 16.75
Drop forge flashings .....	11.00 to 11.50
Hydraulic compressed sheets. ....	12.00 to 13.50
Axle turnings .....	12.75 to 13.25
Steel angle bars .....	17.50 to 18.00
Steel knuckles and couplers. ....	19.00 to 19.50
Coil springs .....	20.00 to 20.50
Low phos. punchings .....	17.00 to 17.50
Machine shop turnings .....	9.00 to 9.50
Cast borings .....	10.50 to 11.00
Short shoveling turnings .....	10.50 to 11.00
Railroad malleable .....	17.50 to 18.00
Agricultural malleable .....	17.00 to 17.50

Per Net Ton	
Iron angle and splice bars. ....	16.50 to 17.00
Iron arch bars and transoms. ....	20.00 to 20.50
Iron car axles .....	26.00 to 26.50
Steel car axles .....	16.50 to 17.00
No. 1 busheling .....	11.50 to 12.00
No. 2 busheling .....	9.50 to 9.00
Pipes and flues .....	10.50 to 11.50
No. 1 railroad wrought .....	14.50 to 15.00
No. 2 railroad wrought .....	12.75 to 14.25
No. 1 machinery cast .....	17.50 to 18.00
No. 1 railroad cast .....	16.00 to 16.50
No. 1 agricultural cast .....	16.00 to 16.50
Locomotive tires, smooth. ....	14.00 to 14.50
Stove plate .....	14.00 to 14.50
Grate bars .....	14.00 to 14.50
Brake shoes .....	14.00 to 14.50

## New York

### Finished Steel Prices Still Yielding— Sales of Buffalo Pig Iron

NEW YORK, June 23.—The accumulation of a backlog by a furnace about to be put in blast to work up an ore stock pile, has resulted in sales in this territory in the past week amounting to about 10,000 tons. Most of the iron was bought by companies in New York whose plants are in the Buffalo district. The total of local sales in the week is put at about 20,000 tons. The fact that prices have changed but little this month has indicated to some buyers the arrival of the low point in this movement. In other cases, however, buying is still postponed and one company in western New York, which recently inquired for 2500 tons of malleable and foundry irons for fourth quarter, has put off closing for the present. Buffalo iron has been sold at \$19, furnace, but 50c. under this price was accepted on a part of the past week's business. Eastern Pennsylvania iron has not figured largely in this market of late. The furnaces in that district are attempting to get a base price of \$20.50, but the recent minimum of \$20 has not disappeared. Among pending inquiries is one for 1500 tons for July and August delivery; another is for 3000 tons of foundry iron for delivery over the last four months of the year. Indications point to a quiet pig iron market for some weeks.

We quote delivered in the New York district as follows, having added to furnace prices \$2.52 freight from eastern Pennsylvania, \$4.91 from Buffalo and \$5.44 from Virginia:

East. Pa. No. 2, sil. 1.75 to 2.25.	\$22.52 to \$23.02
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	23.02 to 23.52
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	22.52 to 23.02
Buffalo, sil. 1.75 to 2.25	23.91 to 24.41
No. 2 Virginia, sil. 1.75 to 2.25	28.44

**Ferroalloys.**—Buying of ferromanganese, while confined to small lots, has shown some improvement in the past week and the total is estimated at several hundred tons, all at \$115, furnace or seaboard. Practically all orders were for prompt shipment.

**Cast Iron Pipe.**—Purchasing by private users of bell and spigot pipe continues in fair volume but municipalities show little activity. One maker reports having closed about 3000 tons of business with private purchasers in the New York district during the past month. The market continues unchanged and fairly firm in the absence of any serious competition from foreign sellers. The soil pipe market shows no improvement, discounts on standard 6-in. pipe ranging from 57½ to 60 per cent off list. Although jobbers are apparently moving their stocks in moderate volume, purchasing for replacement is not heavy despite desirable discounts and makers have sizable tonnages on hand, one producer's stock, according to report, being close to 35,000 tons of soil pipe.

We quote pressure pipe per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, \$50.60 to \$51.60; 4-in. and 5-in., \$56.60 to \$58.60; 3-in., \$65.60 to \$66.60, with \$5 additional for Class A and gas pipe. Discounts of both Northern and Southern makers of soil pipe, f.o.b. New York, are as follows: 6-in., 57½ to 60 per cent off list; heavy, 67½ to 70 per cent off list.

**Finished Iron and Steel.**—Leading makers of wire products have reduced prices \$1 a ton, wire nails now being quoted at 2.65c., coated nails at 1.85c. (this is a \$3 per ton reduction), plain wire, 2.45c. and wire rods, \$45 per gross ton, all f.o.b. Pittsburgh. This change had not been followed today (Tuesday) by all of the smaller makers, but probably will be before the end of the week. The change on wire products was the only formal price reduction of the week, but weakness on other products continues, notably on sheets and cold rolled strips. Galvanized sheets have gone as low as 4.10c., Pittsburgh, while occasional quotations of 3.05c. on black sheets and 2.25c. on blue annealed sheets have further demoralized the market. More common quotations are 3.10c. on black and 2.30c. on blue annealed. On cold rolled strips quotations of 3.60c. and 3.65c. no longer get the business and as low as 3.50c. has been done. Some weakness is also noted in tin plate. Al-

though the price nominally remains at \$5.50 per base box, very few consumers, except the smallest, are paying that price. In some instances contract prices have been revised to \$5.25 and \$5.35. Plates are also weak, and while quotations of 1.80c., Pittsburgh, are not common, it has been necessary for mills to go to 1.85c. to get some orders. Despite this weakness, however, a fair amount of business is being put on the books at 1.90c., including third quarter contracts. In structural shapes the price situation is not much changed, quotations ranging from 1.90c. to 2c., Pittsburgh, with occasional lots at lower than 1.90c. Bars remain firm at 2c. The volume of business for June is satisfactory, some mills reporting that in this territory they are doing quite as well as in May. The largest Eastern steel company is now operating at an average of about 60 per cent.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.34c. to 2.44c.; plates, 2.14c. to 2.24c.; structural shapes, 2.24c. to 2.34c.

**Warehouse Business.**—Increased activity was seen in sheets through the week, as prices fell to 4.35c. base on cold rolled black sheets and 5.35c. base on galvanized. Prices even lower than these were heard. These reductions have not yet affected blue annealed. Cold rolled shafting and screw stock dropped to 3.95c. on rods and hexagons and 4.45c. on squares and flats. Structural steel moved only fair but reinforcing bars were active at 3.05c. to 3.15c. No change was made in the non-ferrous lines. We quote boiler tubes per 100 ft.:

Lapwelded steel tubes, 2-in., \$17.33; seamless steel, 2-in., \$20.24; charcoal iron, 2-in., \$25; 4-in., \$67.

**Coke.**—Beehive output continues its gradual decline and no new life is seen in demand, which in this section is about at a standstill. Further complications arise from offerings by Valley steel works of by-product coke at a figure reckoned back to lower than \$3, Connellsville. Spot furnace coke goes at \$2.75 and foundry grade at \$3.75 to \$4.25, with 25c. to 50c. higher quoted on third quarter contracts, although a large buyer is said to have succeeded in getting third quarter furnace coke below \$3. By-product coke continues at \$10.41, Newark, or other northern New Jersey points.

**Old Material.**—All grades continue fairly steady with No. 1 heavy melting steel being purchased by brokers at \$15 per ton, delivered eastern Pennsylvania, although a recent purchase of about 40,000 tons of heavy melting steel is understood to have been closed at \$15.75 and \$16 per ton with the mill. Borings and turnings are quite active with brokers offering \$12 to \$12.50 per ton, delivered Sparrows Point, Md.; Steelton, Bethlehem, Birdsboro or Swedeland, Pa. Brokers are offering \$14 to \$14.50 per ton, delivered Parksburg on forge fire, but \$13 is about the top price offered on deliveries to a Phoenixville, Pa., consumer. Heavy breakable cast is going forward to Harrisburg at \$16 per ton delivered. Stove plate has advanced locally to \$13.50 per ton, the buying price of brokers delivered West Mahwah, N. J., or Bridgeport, Conn. Delivered to a Phoenixville consumer with a \$3.50 freight rate the buying price is still \$13 to \$13.50 per ton.

Buying prices per gross ton New York follow:

Heavy melting steel, yard.....	\$10.00 to \$10.50
Heavy melting steel, railroad or equivalent.....	11.75 to 12.25
Rails for rolling.....	12.25 to 12.75
Relaying rails, nominal.....	21.00 to 22.00
Steel car axles.....	18.50 to 19.50
Iron car axles.....	23.00 to 24.00
No. 1 railroad wrought.....	13.00 to 13.50
Forge fire.....	10.25 to 10.75
No. 1 yard wrought, long.....	12.00 to 12.50
Cast borings (steel mill).....	9.00 to 9.50
Cast borings (chemical).....	13.00 to 13.50
Machine shop turnings.....	9.00 to 9.50
Mixed borings and turnings.....	8.50 to 9.00
Iron and steel pipe (1 in. diam., not under 2 ft. long).....	11.75 to 12.25
Stove plate.....	10.00 to 11.50
Locomotive grate bars.....	10.50 to 11.00
Malleable cast (railroad).....	13.00 to 14.00
Cast iron car wheels.....	13.00 to 13.50
No. 1 heavy breakable cast.....	12.25 to 12.75

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast.....	\$16.00 to \$16.50
No. 1 heavy cast (columns, building material, etc.), cupola size.....	14.00 to 14.50
No. 2 cast (radiators, cast boilers, etc.).....	13.00 to 13.50



## Birmingham

### Small Lots Predominate—Cast Iron Pipe Prospects Good

BIRMINGHAM, June 22.—Small-lot sales and one or two of more than 200 to 250 tons have recently increased the orders on hand and improved general sentiment in the Southern iron market. The buying so far cannot be declared "a buying movement on" and third-quarter sales do not look so happy as some furnace interests have been hoping. Quotations are at \$20 per ton, No. 2 foundry, base, Birmingham, but larger melters are seeking concessions. Reported sale of a quantity of iron at \$19 per ton is not confirmed on inquiry among four independent companies not using iron for steel making. Small-lot sales for immediate delivery still bring \$20.50 per ton. The make for the month promises to equal that of May. The Woodward Iron Co. will blow out a furnace for relining. Another furnace is scheduled to go out during the next 30 days in the readjustment of market conditions. Two active companies report some reduction recently in surplus stock. The total amount of iron in yards, however, remains greater than six months ago. Local melters are reporting steady business with one interest and that is a large consumer. First half of year's statistics hold out bright prospects of increase over same period last year.

We quote per gross ton, f.o.b. Birmingham district furnaces, as follows:

No. 2 foundry, 1.75 to 2.25 sil....	\$19.00 to \$20.50
No. 1 foundry, 2.25 to 2.75 sil....	19.50 to 21.00
Basic .....	20.00
Charcoal, warm blast .....	30.00

**Finished Steel.**—Fabricating plants are receiving many contracts from local territory and from Florida, where development is under way in great strides, office buildings and hotels springing up on all sides. Ingalls Iron Works, the largest steel fabricating plant of the Birmingham district, reports several contracts from Florida, 800 tons of structural steel for a new hotel at Palm Beach, 1500 tons structural steel for a 10-story office building at St. Petersburg and three seven-story hotels in that State. All fabricating plants of the district are working practically to capacity and moving the product as rapidly as possible. Soft steel bars are holding at 2.15c. to 2.25c., Birmingham.

**Cast Iron Pipe.**—Lettings of pressure pipe, still coming in, are adding to the unfilled tonnage on books. Several specifications are for the future and the assertion is made that the last half will see warrant for as steady operation as has taken place during the first half. Soil pipe and fittings are still reported slow and quotations uncertain. Cast iron pressure pipe quotations are on a \$40 per ton base, 6-in. and over.

**Coke.**—Production and shipment of coke by independent producers shows little change. Longer hours for production are noted in a few batteries of by-product ovens, but on the whole the output is as good now as it has been. Quotations for foundry coke are on a \$5 per ton base, maximum, with \$4.50 reported.

**Old Material.**—Considerable small-lot shipments of old material are noted, with dealers asserting that this condition will continue for some time, the unfilled tonnage being considerable, everything considered. Quotations are unchanged this week, heavy melting steel being down to \$13.

We quote per gross ton, f.o.b. Birmingham district yards, as follows:

Cast iron borings, chemical.....	\$15.00 to \$16.00
Heavy melting steel .....	13.00 to 14.00
Railroad wrought .....	12.00 to 13.00
Steel axles .....	17.00 to 18.00
Iron axles .....	18.00 to 19.00
Steel rails .....	13.00 to 14.00
No. 1 cast .....	16.50 to 17.00
Tramcar wheels .....	16.50 to 17.00
Car wheels .....	15.00 to 16.00
Stove plate .....	13.00 to 14.00
Machine shop turnings .....	7.00 to 8.00
Cast iron borings .....	8.00 to 9.00
Rails for rolling .....	16.50 to 17.00

## San Francisco

### Weak Prices and Interest in Foreign Materials Continue

SAN FRANCISCO, June 20 (By Air Mail).—Developments during the past week emphasized the weakness of prices, and again directed attention to the movement of foreign materials. Lower quotations are now being made in sheets, plates and scrap, and low bids, recently made in connection with several fabricated jobs, are believed to indicate a new price weakness in shapes. A local distributor recently imported from Belgium 500 tons of structural columns for stock, which are understood to be identical with Bethlehem standard H-columns. A local importer has received about 4000 tons of coke and 500 tons of pig iron from England. Belgian reinforcing bars have been quoted at 1.95c., duty paid, c.i.f. San Francisco, for squares, and 1.80c. for rounds, for lots of 50 tons or more. The last previous low quotation was 2c. The Caterpillar Tractor Co., San Leandro, Cal., has placed 150 tons of cold rolled shafting with an unnamed mill. The Booth-Kelly Lumber Co. has placed about 200 tons of 90-lb. relay rails with an unannounced firm. An Oriental consumer recently placed 4000 base boxes of tin plate with one of the independent mills. The San Joaquin Light & Power Co. is inquiring for 150 tons of drill steel.

**Pig Iron.**—No new inquiries were reported during the week. A local importer received 500 tons of 2.50 to 3 per cent silicon foundry iron from England, which is quoted at \$27, duty paid, f.o.b. cars, San Francisco. The Southern Pacific Co. has not as yet closed on 500 tons of 2.75 to 3.25 per cent silicon foundry iron. Prices are weak but unchanged.

•Utah basic .....	\$27.25 to \$28.25
•Utah foundry, sil. 1.75 to 2.25....	27.50 to 28.50
•Scotch foundry .....	28.00 to 30.00
•English foundry .....	27.00 to 28.00
•Belgian foundry .....	26.00
•Dutch foundry .....	25.00
•Indian foundry .....	26.50
•German foundry .....	26.50
•Birmingham, Ala., foundry, sil. 2.75 to 3.25 .....	29.00 to 30.00

•Delivered San Francisco.

•Duty paid, f.o.b. cars San Francisco.

**Shapes.**—Lettings during the week aggregated 4520 tons. Fresh inquiries call for 1696 tons. Prices are nominally 2.40c. to 2.45c., c.i.f. Coast ports, but low bids submitted recently indicate that better than 2.40c. is regarded as possible for desirable tonnages. It is understood that the Virginia Bridge & Iron Works took the 2200 tons involved in fabricating the Everett-Marysville bridges for the Washington State Highway Commission, at 4.25c. About 1150 tons of sheet piling has been placed with an Eastern mill for the Oakland-Alameda estuary tube. The 170 tons of sheet piling called for in connection with the outfall sewer in Los Angeles has been canceled. Wood piling will be used. About 715 tons is being called for by the Oregon State Highway Commission for three bridges. Bids will close June 25. Between 600 and 700 tons will be required for an addition to the Meir-Frank Building, Portland, Ore.

**Plates.**—Awards totaled 1869 tons and new jobs will require about 340 tons. Prices are weak, 2.35c., c.i.f. Coast ports, having been quoted by independent mills, although 2.40c. is still considered as the general market price for moderate tonnages. The Southern Pacific Co. has placed 289 tons and the Pan-American Petroleum & Transport Co. has placed 350 tons, for stock, with Eastern mills. J. A. McEachern & Co. have placed 200 tons of plates and sheet piling with an Eastern mill. The Petroleum Midway Co., Ltd., has awarded three 80,000-bbl. tanks, 900 tons, to the Western Pipe & Steel Co. A Los Angeles fabricator is inquiring for 240 tons and about 100 tons will be needed for the Spokane pipe line.

**Bars.**—Lettings reported totaled 1522 tons. Prices are unchanged. Local mills quote soft steel bars 2.45c., 100-ton lots, f.o.b. San Francisco, and 2.50c., base per 100 lb. Reinforcing bar prices out of stock are as fol-

lows: 250 tons, 3.25c., base; carload, 3.35c., base; l.c.l., 3.50c. to 3.80c., base. Among the larger lettings of the week were the following:

Providence Hospital, Oakland, Cal., 500 tons, to unnamed San Francisco jobber.

Washington State Highway Commission, for Everett-Marysville Bridges, 629 tons, to Pacific Coast Steel Co., through J. A. McEachern & Co., general contractor.

California State Highway Commission, for three bridges in Nevada County, 143 tons, to unnamed San Francisco jobber.

Douglass Everett School, San Francisco, Cal., 150 tons, to unnamed San Francisco jobber.

Villa Creek Bridge and Southern Pacific Railroad crossing at Pismo, San Luis Obispo County, Cal., aggregate of 100 tons to unannounced jobber through J. L. Webster, general contractor.

**Cast Iron Pipe.**—The East Bay Water Co., Oakland, Cal., has placed 1380 tons of 4 and 6-in. B, with an unnamed producer. Prices are unchanged, \$52 to \$53 base, in the San Francisco district. Inquiries are slack, and pending tonnages are small.

**Sheets.**—Interest is backward, in spite of the fact that quotations are low. No award has yet been made for the 500 tons of one-pass black sheets required for the California License Bureau. In galvanized sheets, 4.10c. Pittsburgh base has been named, although 4.15c. is more general. Current quotations are as follows: Blue annealed sheets, 2.30c. to 2.40c.; black sheets, 3.15c. to 3.20c.; galvanized sheets, 4.10c. to 4.25c., all Pittsburgh base.

**Warehouse Business.**—Buying continues small in volume, although in the aggregate it is fairly substantial. Prices are unchanged, but signs of weakness are evident in some lines.

Merchant bars, \$3.30 base per 100 lb.; merchant bars,  $\frac{3}{4}$  in. and under, rounds, squares and flats, \$3.80 base, per 100 lb.; soft steel bands, \$4.15 base, per 100 lb.; angles,  $\frac{3}{4}$  in. and larger x  $1\frac{1}{2}$  in. to  $2\frac{3}{4}$  in., inc., \$3.30 base, per 100 lb.; channels and tees,  $\frac{3}{4}$  in. to  $2\frac{3}{4}$  in., inc., \$3.90 base, per 100 lb.; angles, beams and channels, 3 in. and larger, \$3.15 base, per 100 lb.; tees, 3 in. and larger, \$3.30 base, per 100 lb.; universal mill plates,  $\frac{3}{4}$  in. and heavier, stock lengths, \$3.30 base, per 100 lb.; spring steel,  $\frac{1}{4}$  in. and thicker, \$6.30 base, per 100 lb.; wire nails, \$4 base, per 100 lb.; cement coated nails, \$3 base, per 100 lb.; No. 10 blue annealed sheets, \$4.20 per 100 lb.; No. 28 galvanized sheets, \$6.25 per 100 lb.; No. 28 black sheets, \$5.25 per 100 lb.

**Coke.**—About 4000 tons of English coke was received during the week by a local importer. Current sales are in good volume, and prices are fairly steady.

English beehive, \$14.50 to \$17 at incoming dock, and English by-product, \$12.50 to \$14; Birmingham, Ala., by-product, \$19 to \$20 delivered; Wise County, Va., beehive, \$22 delivered.

**Old Material.**—Heavy melting steel is now being quoted 50c. lower, and country mixed scrap is also down 50c. per gross ton. No. 1 cast scrap is quoted \$22 to \$24 per gross ton. The last lot sold went at \$23.

Prices for scrap delivered to consumer's yards are as follows:

	Per Gross Ton
No. 1 heavy melting steel.....	\$10.50 to \$11.00
Scrap rails, miscellaneous.....	10.50 to 11.00
Rolled steel wheels.....	10.50 to 11.00
Couplers and knuckles.....	10.50 to 11.00
Mixed borings and turnings.....	6.00 to 6.50
Country mixed scrap.....	8.00 to 8.50
No. 1 cast scrap.....	22.00 to 24.00

## Small Advances in Scrap at Detroit

DETROIT, June 23.—Consumers are not buying heavily and the market is still in dealers' hands. But it shows a strengthening tendency with small advances in heavy melting steel and long turnings. Bids close this week on the July offerings of a leading motor company covering about 6000 tons of hydraulic compressed and various smaller grades.

The following prices are quoted on a gross ton basis f.o.b. producers' yards, excepting stove plate. No. 1 machinery cast and automobile cast, which are quoted on a net ton basis:

Heavy melting and shoveling steel.....	\$13.25 to \$13.75
Borings and short turnings.....	10.25 to 10.75
Long turnings.....	10.00 to 10.50
No. 1 machinery cast.....	15.00 to 16.00
Automobile cast.....	22.00 to 23.00
Hydraulic compressed.....	11.75 to 12.25
Stove plate.....	12.50 to 13.00
No. 1 busheling.....	12.00 to 12.50
Sheet clippings.....	8.75 to 9.25
Flashings.....	10.50 to 11.00

## Cincinnati

### Evidence of Bottom Prices in Pig Iron—Scrap Buying Limited

CINCINNATI, June 23.—Evidence that prices of Northern pig iron have scraped bottom is seen in the refusal of furnaces in the Ironton district to go below \$19, furnace. Sales have decreased in volume during the past week and no sizable inquiries are out at present. Furnace interests are not disposed to book orders unless they can secure this figure, even though several Lake furnaces are reported to be selling in this territory at \$18.50, furnace. A Cincinnati foundry has taken 700 tons of Northern foundry at \$19, Ironton, while the Parkersburg Rig & Reel Co., Parkersburg, W. Va., has closed for 2000 tons. Sale of 500 tons of Northern foundry to a central Ohio melter has been made by a local dealer. The International Harvester Co. has purchased 1000 tons of malleable for its Springfield, Ohio, plant. Increased activity in Tennessee iron has been noted. Sales totaling about 1250 tons have been made at \$17.50, Birmingham. Little interest is being displayed in silvery iron, which is being quoted at \$24, Jackson, for 6 per cent. Alabama furnaces vary in their quotations from \$18.50 to \$20.50, Birmingham. One sale of 100 tons at the latter price was recorded in this territory. However, the Alabama interests are unable to compete successfully with Northern iron at the present scale of prices. The Hatfield Penfield Co., Bucyrus, Ohio, has bought 500 tons of low phosphorus iron.

Based on freight rates of \$4.05 from Birmingham and \$2.27 from Ironton we quote f.o.b. Cincinnati:

Alabama fdy., sil. 1.75 to 2.25	
(base).....	\$22.55 to \$24.55
Alabama fdy., sil. 2.25 to 2.75.....	23.05 to 25.05
Tennessee fdy., sil. 1.75 to 2.25.....	21.55
Southern Ohio silvery, 8 per cent.....	28.77
Southern Ohio fdy., sil. 1.75 to 2.25.....	21.27
Southern Ohio, basic (nominal).....	22.27
Southern Ohio, malleable.....	22.27

**Sheets.**—A steady flow of small orders is coming in from consumers who are depending on mills for quick delivery. In almost all cases delivery is to be made in 30 to 40 days. While no improvement has appeared in the price situation, quotations have gone no lower than they were last week. Black sheets are being sold at 3.20c., Pittsburgh, to 3.30c., with several independent producers taking business as low as 3.10c. to 3.15c. The market on galvanized sheets ranges from 4.20c. to 4.35c., although a few orders are being booked at higher figures. The price of blue annealed is fairly steady at 2.30c. to 2.40c., Pittsburgh. Auto sheets are quoted at 4.25c. to 4.30c., Pittsburgh.

**Bars, Plates and Shapes.**—A fair volume of business has been placed locally, but it is limited to small tonnages. Sales of bars have been active in the past week. One large seller states that bookings during June are showing an increase of approximately 30 per cent compared with the same period in May. Bars are selling at 2c., Pittsburgh, to 2.10c. Demand for structural shapes and plates is fair, although no sizable awards have been made recently. Weakness in price has developed, with 1.95c., Pittsburgh, being quoted by several independent mil's. The bulk of the orders are going at 2c.

**Reinforcing Bars.**—No large awards have been made, but several projects are pending. Harry Hake, Cincinnati architect, has taken bids on the new electrical buildings to be erected at the University of Cincinnati. This involves about 100 tons. Decision is anticipated shortly on the building for the Sacred Heart Academy, which will take between 150 and 200 tons. The Kroger Grocery & Baking Co. is to build a large warehouse at Columbus, Ohio, but the tonnage in this is unknown. Several small jobs have been let in the past 10 days, but none of them calls for more than 60 tons. Prices are somewhat unsteady, due to severe competition. New billets are selling at 2c., mill, to 2.05c., but it is reported that an attractive tonnage would probably bring out a quotation of 1.95c., mill. Rail steel is quoted at 1.90c. to 1.95c., mill.



**Wire Products.**—Keen bidding for business by mills in the Ironton territory has brought out further price concessions in the local market. Eastern mills are offering nails at 2.84c. delivered in Cincinnati, but consumers in many cases have been able to fill their needs at lower figures. In plain wire Pittsburgh mills have reduced their quotations to 2.59c., delivered here, thereby meeting a price of 2.45c., Ironton. However, desire for orders to keep mills operating on present schedules has impelled the independents to offer prices reported to be as low as 2.49c., delivered in this market. Little selling activity is evident. The Big Four Railroad is now taking bids on its third quarter requirements in galvanized and barbed wire, woven wire fence and common wire nails. Most of the jobbers are well taken care of on their immediate needs and are not inclined to buy much, even in view of the low prices obtainable.

**Warehouse Business.**—Leading jobbers state that the volume of business this month is showing a considerable increase compared with May. Sales of pipe and tubular goods continue to be heavy, but the market for sheets and wire goods is sluggish. Local jobbers have decreased their price on sheets, the new quotations being 4.10c. for black sheets, 3.60c. for blue annealed and 5.25c. for galvanized.

Cincinnati jobbers quote: Iron and steel bars, 3.30c.; reinforcing bars, 3.30c.; hoops, 4.35c.; bands, 3.95c.; shapes, 3.40c.; plates, 3.40c.; cold-rolled squares, 4.55c.; open-hearth spring steel, 4.75c. to 5.75c.; No. 10 blue annealed sheets, 3.60c.; No. 28 black sheets, 3.60c.; No. 28 galvanized sheets, 5.25c.; No. 9 annealed wire, \$3.05 per 100 lb.; common wire nails, \$3.10 per keg base; cement coated nails, \$2.65 per keg; chain, \$7.55 per 100 lb. base; large round head rivets, \$3.75 base; small rivets, 65 per cent off list. Boiler tubes, prices net per 100 ft., lap welded steel tubes, 2-in., \$18; 4-in., \$38; seamless, 2-in., \$19; 4-in., \$39.

**Coke.**—A fair volume of business is being done locally. However, specifications for foundry needs are lighter than they were in May. Furnace grades are quiet, due to curtailment of furnace operations. Quotations are fairly firm, with no changes reported.

**Old Material.**—Scattered sales have been made in the scrap market, but activities continue to be limited. Only a few inquiries have been received by local dealers and there is no indication of extensive buying by mills in this territory. Prices remain unchanged.

We quote dealers' buying prices, f.o.b. cars, Cincinnati:

Per Gross Ton	
Heavy melting steel	\$14.00 to \$14.50
Scrap rails for melting	14.00 to 14.50
Short rails	18.00 to 18.50
Relaying rails	28.00 to 28.50
Rails for rolling	15.50 to 16.00
Old car wheels	14.50 to 15.00
No. 1 locomotive tires	17.50 to 18.00
Railroad malleable	16.50 to 17.00
Agricultural malleable	15.50 to 16.00
Loose sheet clippings	10.00 to 10.50
Champion bundled sheets	12.00 to 12.50
Per Net Ton	
Cast iron borings	9.00 to 9.50
Machine shop turnings	8.00 to 8.50
No. 1 machinery cast	18.00 to 18.50
No. 1 railroad cast	16.00 to 16.50
Iron axles	22.50 to 23.00
No. 1 railroad wrought	11.50 to 12.00
Pipes and flues	9.00 to 10.00
No. 1 busheling	10.50 to 11.00
Mixed busheling	9.50 to 10.00
Burnt cast	10.00 to 10.50
Stove plate	10.50 to 11.00
Brake shoes	11.50 to 12.00

## Youngstown Company Finds Better Business

YOUNGSTOWN, June 23.—The Youngstown Sheet & Tube Co. reports that shipments this month to June 18 were 5 per cent ahead of corresponding period in May, and specifications were 30 per cent greater. The outlook is for improved operations at an early date, the company advises.

Sales of pig iron this month were several times larger than in May, with selling particularly brisk in the Chicago district.

In finished steel lines, improved demand has been felt especially in merchant steel bars, wire and steel pipe. Heavier drilling by the oil industry is an important contributing factor to current steel demand, according to the officials.

## Cleveland

### Third Quarter Bar Business—Steel Bookings Exceed Last Month's

CLEVELAND, June 23.—The volume of current business with some of the mills shows a slight gain over the previous month. A moderate amount of business also is being booked in steel bar contracts for the third quarter. The total tonnage entered in this territory during June is expected to equal and probably show a little gain over May. Consuming plants are operating at about the recent rate and steel manufacturers do not appear to be showing the anxiety that they did a few days ago because of their inability to accumulate a backlog.

There has been some slowing down in the automotive industry but production of cars has kept up at a better rate in June than in previous years and a number of car builders expect to continue operations at a good rate during July. Automobile companies are buying steel more closely than earlier in the season, although some good tonnages have come from this source for the third quarter. New inquiry for steel in the building field is light in this territory. In the oil industry new inquiry has come out for 20 stills requiring 600 tons of plates.

The only development in the price situation is the more common naming of 1.90c., Pittsburgh, for plates, which is being frequently quoted for car lot business, although 2c. has not disappeared. Steel bars and structural material are firm at 2c.

**Pig Iron.**—The buying movement continues to taper off. Sales during the week were in smaller lots than during the few previous weeks, business coming more from the smaller foundries. One interest booked 17,000 tons, but sales by other producers were considerably lighter than during the previous week. There is still a fair amount of inquiry coming out, one producer having new inquiries for 10,000 tons. However, most of the foundries have covered for either the third quarter or last half. Signs of a stiffening in the price situation reported last week are still in evidence. Valley furnaces appear to be holding to \$18.50 for foundry and malleable grades and one Valley furnace is now asking \$19. Some of the Lake furnaces are on a \$19 base and this is the ruling price in the Michigan territory. For Cleveland delivery the price is unchanged at \$19.50 at furnace. Steel making iron is inactive. Low phosphorus iron is still quoted nominally at \$28, Valley furnace, but this would have to be shaded considerably to meet the competition of Eastern and foreign iron, Pickands, Mather & Co. blew out their Perry furnace at Erie, Pa., June 18.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a \$3.02 freight rate from Jackson and \$6 from Birmingham:

Basic, Valley furnace	\$18.00
N't'n No. 2 fdy., sil. 1.75 to 2.25	20.00
Southern fdy., sil. 1.75 to 2.25	24.50 to 24.01
Malleable	20.00
Ohio silvery, 8 per cent.	29.02
Standard low phos., Valley furnace	28.00

**Iron Ore.**—Some of the Lake Superior ore mines have already produced 50 per cent of the ore they have sold this year and unless there is considerable additional buying their operations will have to be curtailed sharply later in the season. The consumption of Lake Superior ore during May was 4,357,491 tons, a decrease of 455,506 tons from April. The amount consumed in May last year was 3,830,457 tons. Ore on hand at furnaces June 1 was 16,526,976 tons. The amount at furnaces and Lake Erie docks June 1 was 21,049,160 tons, as compared with 21,607,619 tons on June 1 last year. Interior furnaces in the central district in May consumed 2,228,392 tons, a decrease of 335,343 tons from April. Lake front furnaces consumed 1,931,015 tons, a decrease of 87,506 tons. Eastern furnaces consumed 82,491 tons, a decrease of 30,515 tons, and all-rail furnaces consumed 115,593 tons, a decrease of 2142 tons. There were 170 furnaces using Lake ore in blast May 31, a decrease of 22 for the month.

**Semi-Finished Steel.**—Buyers and sellers of sheet bars are still marking time, but as some of the mills will have to cover for their July requirements, it is expected that the question of price will be settled this week. Buyers are looking for a price not over \$33. Consumers report that slabs can be bought at \$33.

**Strip Steel.**—The cold rolled strip steel market is weak. A further concession of \$1 a ton to 3.40c. has been made, and while some orders are being taken at 3.50c., there are unconfirmed reports of prices lower than 3.40c. On hot rolled strip steel one mill is quoting 2.35c. for narrow material, though 2.40c. is the more common price. Wide strip ranges from 2.10c. to 2.20c.

**Sheets.**—Although many thought that sheets had touched bottom, lower prices than had been prevailing appeared during the week and the market is still in a very unsettled price situation. As a result, buying is restricted and some consumers are holding off as long as possible before placing orders. On black sheets quotations as low as 3.05c. have appeared and 3.15c. now appears to be the top of the market. Blue annealed sheets range from 2.20c., Valley, to 2.30c., Pittsburgh. Further concession of \$1 a ton has been made on galvanized sheets, which range from 4.15c. to 4.20c., Pittsburgh. Auto body sheets appear to be holding to 4.25c.

**Bolts, Nuts and Rivets.**—Weakness that recently developed in stove bolts has resulted in a price reduction of about 10 per cent on these bolts. Other prices generally are being maintained. Specifications continue good. The automotive industry is still ordering freely on contracts, but not much new business is coming from this source. Rivet specifications are light, although makers are booking a good number of third quarter contracts. Prices for current business are still irregular.

**Wire Products.**—Lower prices have appeared on wire products. Nails are being quoted at \$2.65, Cleveland, and the jobber's price on car lots has been reduced to \$2.75. Annealed wire is now quoted by mills at \$2.60, galvanized wire at \$3.05, galvanized staples at \$3.35 and bright staples at \$3.10.

**Warehouse Business.**—Cleveland jobbers have reduced prices \$2 a ton on cold finished steel. Jobbers have made reductions on nails and wire.

Jobbers quote steel bars, 3.10c.; plates and structural shapes, 3.20c.; No. 28 black sheets, 3.90c.; No. 28 galvanized sheets, 5.10c.; No. 10 blue annealed sheets, 3.10c.; cold-rolled rounds and hexagons, 3.80c.; flats and squares, 4.30c.; hoops and bands, 3.85c.; No. 9 annealed wire, \$3 per 100 lb.; No. 9 galvanized wire, \$3.45 per 100 lb.; common wire nails, \$3 base per 100 lb.

**Coke.**—There is a fair and steady demand for foundry coke for prompt shipment, with prices unchanged. More by-product furnace coke is coming on the market, a round lot being offered this week by a Valley district steel maker. We quote Ohio by-product foundry coke at \$6.50, Fairport.

**Old Material.**—The market is weak and is stagnant. However, quotations on most grades are unchanged. Consumers are showing no interest in scrap and some in the trade look for price reductions before mills begin to buy. Considerable scrap is being offered, but producers and dealers are having difficulty in holding it, the only demand coming from dealers who have made sales. Dealers do not regard present prices low enough to buy for yard stocks.

We quote dealers' prices f.o.b. Cleveland per gross ton:

Heavy melting steel	\$15.25 to \$15.50
Rails for rolling	15.00 to 15.50
Rails under 3 ft.	18.50 to 19.00
Low phosphorus melting	17.00 to 17.25
Cast iron borings	12.25 to 12.75
Machine shop turnings	12.25 to 12.75
Mixed borings and short turnings	12.25 to 12.75
Compressed sheet steel	13.25 to 13.50
Railroad wrought	12.00 to 12.25
Railroad malleable	17.75 to 18.00
Light bundled sheet stampings	11.00 to 11.50
Steel axle turnings	14.25 to 14.50
No. 1 cast	17.75 to 18.00
No. 1 busheling	12.25 to 12.50
Drop forge flashings	11.75 to 12.00
Railroad grate bars	13.25 to 13.50
Stove plate	13.25 to 13.50
Pipes and flues	9.00 to 9.25

## Buffalo

### Steel Buying Better Than for Same Periods of April or May

**BUFFALO, June 23.**—Inquiry for the past week is not quite so heavy, the whole aggregating 5000 tons, with 1000 tons of malleable and 1000 tons of foundry, both from State melters, featuring the demand. Another inquiry was from the Gleason Co., Rochester, N. Y., which sought 1000 tons of foundry and malleable. The Massey-Harris inquiry for 2000 tons, put out previously, is believed to have been placed. The price ranges around \$19, base, with this price being done on 2.25 to 2.75 per cent silicon, also in some cases. Banking of Bethlehem stacks has reduced this company's active list to four and the district's to ten.

We quote prices f.o.b. gross ton, Buffalo, as follows:

No. 2 plain, sil.	1.75 to 2.25...	\$19.00
No. 2X foundry, sil.	2.25 to 2.75...	\$19.00 to 19.50
No. 1 foundry, sil.	2.75 to 3.25...	19.50 to 20.50
Malleable, sil. up to 2.25	.....	12.00
Basic	.....	18.50
Lake Superior charcoal	.....	29.28

**Finished Iron and Steel.**—Warehouse interests report business better thus far in June than for the corresponding periods in April or May. The warehouse sheet prices have been reduced to bring them more nearly into line with mill prices. Bars and shapes are steady at 2.265c., delivered Buffalo. An increase in the total of the smaller structural jobs is noticed. One of the features of the week was the taking of bids on the new East High School, for which several hundred tons of steel will be required as well as a considerable tonnage of reinforcing bars. The Huyler candy store job of 100 tons of reinforcing bars has been placed.

Warehouse prices are being quoted as follows:

Steel bars, 3.25c.; steel shapes, 3.35c.; steel plates, 3.35c.; No. 10 blue annealed sheets, 3.80c.; No. 28 black sheets, 4.75c.; No. 28 galvanized, 5.45c.; cold rolled shapes, 4.40c.; cold rolled rounds, 3.95c.; wire nails, 4.00c.; black wire, 4.05c.

**Old Material.**—One Buffalo mill is interested in the purchase of small lots of heavy melting steel, for which it is willing to pay \$15.50 and possibly \$16. Not much tonnage is available and the mill does not care for a lot of material at this price. Some of the dealers, who have been hard pressed for delivery by another local mill, are paying \$17 to \$17.25 in some instances for heavy melting steel to apply against orders taken some time ago. The same mill is also insistent on delivery of previously taken orders of hydraulic compressed and No. 1 busheling. The going price on these two grades is \$14.50. Stove plate is in fairly active demand, with one local purchaser willing to pay \$15 to \$15.25. A fairly good demand exists for borings and turnings for blast furnace use at \$12 to \$12.50. Cast iron borings and machine shop turnings are reasonably firm at \$10.50 to \$11. The present pace of mill operation does not warrant mills in heavily augmenting their scrap stocks.

We quote prices f.o.b. gross ton, Buffalo, as follows:

Heavy melting steel	\$15.50 to \$16.00
Low phosphorus	18.50 to 19.50
No. 1 railroad wrought	14.00 to 14.50
Car wheels	15.00 to 16.00
Machine shop turnings	10.50 to 11.00
Cast iron borings	10.50 to 11.00
No. 1 busheling	14.50
Stove plate	15.25
Grate bars	12.50 to 13.00
Bundled sheets	11.50 to 12.00
Hydraulic compressed	14.50
No. 1 machinery cast	16.50 to 17.00
Railroad malleable	17.00 to 17.50
No. 1 cast scrap	16.50 to 17.00
Iron axles	26.00 to 27.00
Steel axles	17.00 to 17.50

The A. M. Byers Co., Pittsburgh, has appointed Hickman, Williams & Co., Oliver Building, Pittsburgh, as exclusive representatives in the disposal of surplus pig iron produced at the Girard furnace operated by the Byers company.



## Boston

### Buffalo Pig Iron Leads in Activity— Prices Unsettled

BOSTON, June 23.—Buffalo pig iron leads in activity here, with India and western Pennsylvania second and third respectively. No special kind of iron is active, however. Current business is confined to iron to be shipped within the third quarter, furnaces being reluctant to quote for the last three months and foundries unwilling to contract so far ahead. Quotations on Buffalo iron continue more or less unsettled. While the most active sellers are fairly consistently holding to \$19.50 furnace base, \$19 can be done, and sales the past week included one lot of 200 tons No. 2X at \$19, while No. 1X sold at \$20.50, representing a concession of 50c. a ton. Western Pennsylvania iron is generally \$19.50 furnace base, equivalent to a like Buffalo base. India iron is selling on a delivered base equivalent to or a shade under the Buffalo delivered. Comparatively little eastern Pennsylvania and Virginia irons are obtainable, but this fact so far has failed to stimulate prices. Alabama iron sells in a small way, notwithstanding prices for it are considerably above the Buffalo delivered base.

We quote delivered prices on the basis of the latest sales as follows, having added \$3.65 freight from eastern Pennsylvania, \$4.91 from Buffalo, \$5.92 from Virginia, and \$9.60 from Alabama:

East. Penn., sil. 1.75 to 2.25....	\$23.65 to \$24.65
East. Penn., sil. 2.25 to 2.75....	24.15 to 25.15
Buffalo, sil. 1.75 to 2.25.....	23.91 to 24.41
Buffalo, sil. 2.25 to 2.75.....	23.91 to 24.91
Virginia, sil. 1.75 to 2.25.....	28.42 to 29.92
Virginia, sil. 2.25 to 2.75.....	28.92 to 30.42
Alabama, sil. 1.75 to 2.25.....	29.60
Alabama, sil. 2.25 to 2.75.....	30.10

**Plates and Shapes.**—Structural steel is fairly active, especially for this time of the year, but fabricating jobs as a rule do not involve more than 100 to 200 tons. Yet because of the numerous small tonnages coming on the market, weekly average bookings by mill representatives are running ahead of those for the corresponding period last year. The market for plates is quiet, with 1.90c. on cars Pittsburgh the prevailing basis of prices. Standard shapes are openly quoted at 2c. on cars Pittsburgh base, but offers are reported to have been made at slightly less.

**Coke.**—By-product foundry coke producers in this territory report specifications against contracts as well as spot business as declining. Daily shipments from ovens are running well below those of a year ago and slightly less than a month back. The average New England foundry has no sizable reserve stock of fuel and is taking in fresh coke in a hand-to-mouth manner owing to the more or less uncertainty as to future casting requirements and because of the narrow margin of profit at which foundries are operated. Both the New England Coal & Coke Co. and the Providence Gas Co. quote by-product foundry coke at \$11.50 a ton delivered in New England.

**Old Material.**—Quotations on old material are holding steady, a lack of real activity in business notwithstanding. Local dealers report mills willing to take on sizable tonnages at going prices, but yards and producers of scrap are reluctant to sell, believing that prices will be higher. The supply of such material as borings and turnings as well as forged scrap is comparatively small, due to the comparative inactivity of metal working shops, a contributing factor to the market's quietness. Recent sales of heavy melting steel for shipment to eastern Pennsylvania points are reported at \$11.50 to \$12 on cars, mostly \$11.50, while \$11 appears to be about the best price obtained for specification pipe. Short bundles of cotton ties sold at \$10 and \$10.25, while forged scrap was taken on the same basis. Rolling mill borings have a better call than do machine shop turnings, consequently are firmer. The market for re-rolling rails is largely nominal due to inactivity. New England plants evince little or no interest in machinery

cast or stove plate and sales of railroad malleable are few and far between.

The following prices are for gross ton lots delivered consuming points:

Textile cast .....	\$20.00 to \$20.50
No. 1 machinery cast.....	18.50 to 19.50
No. 2 machinery cast.....	18.50 to 19.50
Stove plates .....	13.00 to 13.50
Railroad malleable .....	19.00 to 20.00

The following prices are offered per gross ton lots, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel .....	\$11.50 to \$12.00
No. 1 railroad wrought .....	13.00 to 13.50
No. 1 yard wrought .....	12.00 to 12.50
Wrought pipe (1-in. in diam., over 2 ft. long) .....	11.00 to 11.50
Machine shop turnings .....	8.00 to 8.50
Cast iron borings, chemical....	10.50 to 11.00
Cast iron borings, rolling mill....	8.75 to 9.00
Blast furnace borings and turnings .....	7.50 to 8.00
Forged scrap .....	10.00 to 10.25
Bundled skeleton, long .....	8.50 to 9.00
Bundled skeleton, short .....	9.50 to 10.00
Forged flashings .....	9.50 to 10.00
Shaftings .....	17.00 to 17.50
Street car axles .....	16.50 to 17.00
Rolls for re-rolling .....	12.50 to 13.00
Scrap rails .....	11.00 to 11.50

## St. Louis

### Pig Iron and Steel Dull—Coke Contracts Placed

ST. LOUIS, June 22.—The market for pig iron is dull and melters are showing no interest in their future requirements. Quotations are nominal and each sale is the result of dickering. St. Louis Coke & Iron Co. sold 2000 tons of foundry iron, of which 1500 was to a local melter for third-quarter delivery, and 4000 tons of basic for June and July delivery to a St. Louis melter. A Chicago interest which has been making low prices in this market sold 750 tons of foundry iron to a southern Missouri stove manufacturer and 600 tons of foundry iron to a Quincy melter, both for third-quarter delivery. Inquiries are out for about 1500 tons of foundry iron. No sales of consequence of Southern iron were reported during the week.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices \$2.16 freight from Chicago, \$5.17 from Birmingham, all rail, and 81c. average switching charge from Granite City.

Northern fdy., sil. 1.75 to 2.25....	\$22.64
Northern malleable, sil. 1.75 to 2.25 .....	22.64
Basic .....	22.66
Alabama fdy., sil. 1.75 to 2.25 .....	22.67 to 23.67
(rail) .....	22.67
Tennessee fdy., sil. 1.75 to 2.25 .....	22.67
Granite City iron, sil. 1.75 to 2.25 \$1.31 to \$1.81	

**Finished Iron and Steel.**—No new business in structural steel was placed during the week and no projects requiring such material are pending. The Kalman Co., Chicago, will supply 300 tons of reinforcing bars for a cover for a settling basin in Quincy, Ill. The contract for the Y. M. C. A. building in St. Louis, which will require from 350 to 400 tons of reinforcing bars, was let to James Stewart Construction Co. Road contracts were let by the Missouri Highway Commission last week for 400 tons of reinforcing bars.

For stock out of warehouse we quote: Soft steel bars, 3.15c. per lb.; iron bars, 3.15c.; structural shapes, 3.25c.; tank plates, 3.45c.; No. 10 blue annealed sheets, 3.90c.; No. 28 black sheets, cold rolled, one pass, 4.80c.; galvanized sheets, No. 28, 5.80c.; blank corrugated sheets, 4.95c.; galvanized, 5.95c.; cold-rolled rounds, shafting and screw stock, 3.95c.; structural rivets, 3.65c.; boiler rivets, 3.85c.; tank rivets,  $\frac{1}{4}$  in. diameter and smaller, 75 per cent off list; machine bolts, 55 per cent; carriage bolts, 50 per cent; lag screws, 60 per cent; hot pressed nuts, squares, \$3.50; hexagons, blank or tapped, \$4 off list.

**Coke.**—Several important contracts for coke were made during the week, a plow company buying 7500 tons and additional contracts totaled 1500 tons for delivery within the next three or four months. These were placed with the St. Louis Coke & Iron Co. Very little advance business is being done in domestic grades.

**Old Material.**—The only change in old material prices is in miscellaneous rails, which have advanced 50c. Both dealers and consumers are simply marking time. Dealers are buying small tonnages for shear stock. Railroad lists issued during the week include

Canadian National, 2500 tons; Chicago, Burlington & Quincy, 7500 tons, and Wabash, 150 tons.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton	
Iron rails .....	\$14.00 to \$14.50
Rails for rolling .....	17.50 to 18.00
Steel rails less than 3 ft. ....	18.00 to 18.50
Relaying rails, 60 lb. and under...	24.00 to 25.00
Relaying rails, 70 lb. and over...	30.00 to 30.50
Cast iron car wheels .....	17.00 to 17.50
Heavy melting steel .....	14.50 to 15.00
Heavy shoveling steel .....	14.50 to 15.00
Frogs, switches and guards cut apart .....	16.00 to 16.50
Railroad springs .....	18.00 to 18.50
Heavy axles and tire turnings...	11.50 to 12.00
No. 1 locomotive tires .....	18.00 to 18.50
Per Net Ton	
Steel angle bars .....	15.00 to 15.50
Steel car axles .....	18.00 to 18.50
Iron car axles .....	24.00 to 24.50
Wrought iron bars and transoms	19.00 to 19.50
No. 1 railroad wrought .....	13.25 to 13.75
No. 2 railroad wrought .....	13.00 to 13.50
Cast iron borings .....	10.00 to 10.50
No. 1 busheling .....	11.50 to 12.00
No. 1 railroad cast .....	16.50 to 17.00
No. 1 machinery cast .....	17.50 to 18.00
Railroad malleable .....	13.75 to 14.25
Machine shop turnings .....	8.00 to 8.50
Champion bundled sheets .....	9.00 to 9.50

## Philadelphia

### Good Rate of Steel Buying — New Strength in Scrap Market

PHILADELPHIA, June 23.—Steel buying continues at a surprisingly good rate—surprising in view of the nearness of July, which is generally conceded to be the dull month of the year both in steel bookings and in production. The leading Eastern independent steel company is operating at an average of about 60 per cent, which shows a slight decline since the first of the month, and prospects for July are for a still further decline. This company's average rate is brought down, however, by very large plate capacity, which is employed at a much less percentage than other departments of its plants. Buying maintains the same characteristics which have governed it for many weeks; that is, orders are small but there is enough of them to make a very fair total.

Outside of the steel situation the market presents no very interesting phases. Pig iron buying has subsided, but new strength has appeared in the scrap market, where there are advances of at least 50c. a ton on several items.

**Pig Iron.**—There has been a rather sharp falling off in the demand for pig iron, due perhaps to the fact that nearly all consumers, especially the larger ones, have covered their requirements for the third quarter, and in some instances until the end of the year. Despite the fact that asking prices for foundry iron are now generally on the basis of \$20.50, furnace, which is 50c. a ton above the recent low point, there is no real strength in the market. While it is true that sellers are able to get \$20.50 on the orders of average size, some buyers still insist on \$20 and are getting it if the business they have to offer is attractive enough. There is no inquiry for basic, and until there is pronounced improvement in steel buying it is not likely that Eastern steel companies will need to buy new supplies. Small lots of low phosphorus have been sold at prices equivalent to \$26, Philadelphia, for both foreign and domestic copper free iron.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rate varying from 76c. to \$1.63 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	\$20.76 to \$21.63
East. Pa. No. 2X, 2.25 to 2.75 sil.	21.26 to 22.13
East. Pa. No. 1X .....	21.76 to 22.63
Virginia No. 2 plain, 1.75 to 2.25 sil.	28.67 to 29.17
Virginia No. 2X, 2.25 to 2.75 sil.	29.17 to 29.67
Basic delivery eastern Pa. ....	21.50 to 22.00
Gray forge .....	21.50 to 22.00
Malleable .....	22.00 to 22.50
Standard low phos. (f.o.b. furnace) .....	23.00 to 24.00
Copper bearing low phos. (f.o.b. furnace) .....	25.00 to 26.00

**Ferromanganese.**—Small lots of ferromanganese

have been sold in the past week more numerous than in the several weeks preceding. The price remains unchanged and is firm, both domestic producer and importers quoting \$115, furnace or seaboard.

**Billets.**—On an inquiry for forging billets an Eastern mill quoted \$40, Pittsburgh, and there seems to be no disposition here to go lower than that figure. Re-rolling billets, though not in demand, are nominally held at \$35.

**Plates.**—Eastern plate mills disclaim quotations of 1.80c., Pittsburgh, though some admit having taken plate orders at 1.85c. The Philadelphia market is holding fairly well at 1.90c., Pittsburgh, in that the majority of orders are still being entered at that figure. As mentioned last week the low point of the market, 1.80c., has appeared more frequently in the New York district than in the immediate Philadelphia district. Operations of Eastern plate mills are maintained at about the rate of recent weeks, which is around 50 per cent, although there is some variation in this, not all mills going at the same rate. One, in fact, has been averaging close to 75 per cent, while another has been under 50 per cent right along.

**Structural Material.**—The average price on structural shapes is 1.90c., Pittsburgh. This generalization is necessary because of the various ways in which shapes are being quoted. Some Eastern mills are quoting f.o.b. mill and are naming prices which would work back to an equivalent of less than 1.90c., Pittsburgh. Pittsburgh mills in trying to sell in this district find that they must quote 1.90c. to take any desirable tonnage.

**Bars.**—Steel bars remain the outstanding tower of strength in the steel market, excepting of course pipe, which has held steady through several ups and downs of the market. Several fairly good tests of steel bars indicate that the market is firm at 2c., Pittsburgh, the only exception being on bars sold to railroads which have their own car shops. On such orders 1.90c. has been accepted by certain mills. The demand for bar iron is a little better and that commodity holds firm in price at 2.22c., Philadelphia.

**Sheets.**—Both sellers and buyers of sheets are still in a quandary as to where to find the bottom of the market. With some makers registering a loss of several dollars a ton, and this is particularly true of blue annealed sheets, the mills continue to quote lower and lower. The initiative seems to come more from the sellers than from the buyers. The new low point on galvanized sheets is 4.10c., while on black 3.05c. has been quoted. Blue annealed has been holding fairly well at 2.30c. until within the last few days when a few orders have been taken at 2.25c.

**Warehouse Business.**—Buying out of warehouse continues at a fairly good rate. Variations in prices still exist and competition is keen. We quote for local delivery as follows:

Soft steel bars and small shapes, 2.90c. to 3.10c.; iron bars (except bands), 2.90c. to 3.10c.; round edge iron, 3.50c.; round edge steel, iron finished, 1 1/4 x 1/4 in., 3.50c.; round edge steel planished, 4.30c.; tank steel plates, 1/4 in. and heavier, 2.90c. to 3.10c.; tank steel plates, 1/2 in., 3.05c. to 3.25c.; blue annealed steel sheets, No. 10 gage, 3.50c.; black sheets, No. 28 gage, 4.55c.; galvanized sheets, No. 28 gage, 5.65c.; square, twisted and deformed steel bars, 2.85c.; structural shapes, 2.80c. to 3.10c.; diamond pattern plates, 1/4 in., \$5.30c.; 1/2 in., 5.50c.; spring steel, 5c.; rounds and hexagons, cold-rolled steel, 4.15c.; squares and flats, cold-rolled steel, 4.65c.; steel hoops, 4c. base; steel bands, No. 12 gage to 1/4 in., inclusive, 3.75c.; rails, 3.20c.; tool steel, 8.50c.; Norway iron, 6.50c.

**Imports.**—Pig iron came from five different countries to this port last week as follows: From England, 1452 tons; Luxemburg, 530 tons; India, 749 tons; Sweden, 100 tons; Germany, 350 tons. Steel shipments consisted of 572 tons of blooms from France, 427 tons of structural steel from Belgium and 41 tons of steel bands and hoops from Belgium. Other imports were: Manganese ore, from Gold Coast, Africa, 5575 tons; chrome ore, from Portuguese Africa, 1125 tons; iron ore from Spain, 200 tons, and iron ore from Germany, 531 tons.

**Old Material.**—After a brief lapse of weakness, the scrap market has taken on renewed strength and nearly all grades are firmer and some are 50c. a ton or more



higher than a week ago. A part of this strength has been derived from a recovery in the market at Pittsburgh and a part is due to conditions in the East. Purchases of the leading Eastern steel company two weeks ago aggregated about 40,000 tons of heavy melting steel, for which \$16 was paid on a considerable part. Brokers in covering on this material are paying \$15.50. Sales to other consumers have ranged from \$15.50 to \$16.50. Strength has developed in low phosphorus plate scrap, couplers and knuckles, rolled steel wheels, No. 1 railroad wrought, bundled sheets, machine shop turnings for steel works and pipe scrap.

We quote for delivery, consuming points in this district as follows:

No. 1 heavy melting steel.....	\$15.50 to \$16.50
Scrap rails .....	15.50 to 16.50
Steel rails for rolling.....	17.50 to 18.00
No. 1 low phos. heavy 0.04 and under .....	20.50 to 21.50
Couplers and knuckles.....	20.00 to 20.50
Rolled steel wheels.....	20.00 to 20.50
Cast iron car wheels.....	17.00 to 17.50
No. 1 railroad wrought.....	18.50 to 19.00
No. 1 yard wrought.....	17.00 to 17.50
No. 1 forge fire .....	14.50 to 15.00
Bundled sheets (for steel works) .....	13.50
Mixed borings and turnings (for blast furnace use) .....	12.00 to 13.00
Machine shop turnings (for steel works use) .....	13.50
Machine shop turnings (for rolling mill use) .....	13.50 to 14.00
Heavy axle turnings (or equivalent) .....	14.50 to 15.50
Cast borings (for steel works and rolling mill) .....	13.50 to 14.00
Cast borings (for chemical plant) .....	15.50 to 16.00
No. 1 cast .....	17.50 to 18.00
Heavy breakable cast (for steel plants) .....	16.50 to 17.00
Railroad grate bars .....	13.50 to 14.00
Stove plate (for steel plant use) .....	13.50 to 14.00
Wrought iron and soft steel pipes and tubes (new specifications) .....	16.00 to 16.50
Shafting .....	22.00 to 23.00
Steel axles .....	23.00 to 24.00

### Youngstown's Tin Plate Mill in Chicago District

YOUNGSTOWN, June 23.—The Youngstown Sheet & Tube Co. has awarded contracts for the manufacture of 24 hot mills for the new tin plate plant to be installed at Indiana Harbor, Ind., to the United Engineering & Foundry Co., Pittsburgh. Rolls will be 28 in. in diameter, among the largest and heaviest ever ordered for tin plate manufacture.

The cold rolled mills for the Indiana Harbor Works will be furnished by the Hyde Park Foundry & Machine Co., Hyde Park, Pa.

The United Engineering Co. will work off the Sheet & Tube order at its plants in the Youngstown district. With this order and other business on hand, the company will be enabled to operate at capacity for several months.

### High Sheet Production in May

PITTSBURGH, June 23.—Preliminary sheet steel statistics for May as published in THE IRON AGE of June 18, are amply verified in the final calculations just released. Production again in May ran high, amounting to 87 per cent of capacity of the companies reporting. For the five months ending with May the production averaged almost 92 per cent of capacity.

Unfilled orders at the end of May were down about 64,000 tons compared with those at the end of April, but the order books of the companies reporting are heavier by almost 105,000 tons than a year ago.

Sales in May were about 7400 tons less than in the month before but exceed those of May last year by about 60,000 tons. May shipments were about 30,000 tons less than in April, but about 36,000 tons greater than in May last year.

### Cancel Proposed Southern Freight Rates

WASHINGTON, June 23.—Proposed increased rates on iron and steel products from Atlanta, Ga., and other Southern points to Mobile, Ala., and New Orleans, La., have been cancelled by the railroads concerned, and as a result the Interstate Commerce Commission last week announced that proceedings to hold a hearing on the suspended tariff schedules have been discontinued.

### May Postpone Readjustment of Freight Rates

CHICAGO, June 23.—The railroads are expected to ask a 90-day extension of time for the filing of tariffs in compliance with the order of the Interstate Commerce Commission in the Jones & Laughlin case, under which a readjustment of rates from Pittsburgh and Chicago mills, respectively, to Indiana, southern Illinois points and St. Louis was recommended. After numerous conferences the carriers have failed to reach a basis of agreement as to how the new rates shall be applied under the mileage scale proposed. Some contend for a strict application of the scale from each point to every other point, while other lines favor using the group principle.

### Buys Empire Rolling Mill at Cleveland

CLEVELAND, June 23.—The plant of the Empire Rolling Mill Co., Cleveland, manufacturer of black and galvanized sheets, has been purchased by A. W. Wheatley, investment banker, Lima, Ohio, and several associates, who will reorganize and reincorporate the company. The plant will pass to the new owners Aug. 1. Part of the present organization will be retained, but D. R. James, secretary, treasurer and general manager, will retire.

Mr. Wheatley, formerly president of the Lima Locomotive Works, is president of the Delphos Mfg. Co., Delphos, Ohio, manufacturer of roofing and other sheet metal products. It is stated that with the new ownership about 50 per cent of the output of the Empire plant will be consumed by the Delphos company. The plant of the Empire company includes six hot mills and two galvanizing pots.

### Large Machinery Contract with Soviets

A contract involving more than \$1,000,000 has been concluded between the Owens Bottle Co., Toledo, Ohio, manufacturer of bottle making machinery, and the All Russian Syndicate of Silicate Industries (Prodasilicate), the Amtorg Trading Corporation, New York, acting as agent for the syndicate. In addition to the purchase of a number of machines to be installed and operated under the supervision of the Owens company, the Prodasilicate secures all patent rights on this equipment for the Union of Socialist Soviet Republics.

The Amtorg Trading Corporation, 165 Broadway, New York, active in the purchase of materials for export to Russia, reports the shipment this month of a cargo of 1130 agricultural tractors and smaller lots of touring cars, trucks, motorcycles and oil well supplies valued at \$1,200,000. Further purchases of agricultural equipment are being made.

### More Workers Busy in Detroit

The Employers' Association of Detroit announces that for the week ended June 16 a total of 239,855 were employed in the plants of its members, this representing about two-thirds of the total employment in the district. This was a gain of 1408 over the preceding week and, as compared with the corresponding week of 1924, an increase of 37,702. July will doubtless show some decrease, however, as a number of manufacturers of motor cars are catching up with orders and are proceeding more cautiously in their manufacturing schedules, holding their inventories of materials to the lowest mark consistent with safety.

Last year the peak of production was reached early in April and by the close of that month shipments of raw materials and parts had practically been suspended. This is in sharp contrast with the present situation, which has been kept so well in hand that even during the "off" months of July and August automobile production will be of substantial proportions. Foundries producing motor castings are still operating at about the same rate as during the spring months.

# Prices of Finished Iron and Steel Products (Carload Lots)

## Tank Plates

F.o.b. Pittsburgh mill, base, per lb. .... 1.90c.  
F.o.b. Chicago, base, per lb. .... 2.14c. to 2.20c.

## Structural Shapes

F.o.b. Pittsburgh mills, base, per lb. .... 2c.  
F.o.b. Chicago, base, per lb. .... 2.20c.

## Iron and Steel Bars

Soft steel bars f.o.b. P'gh mills, base, per lb. .... 2c.  
Soft steel bars f.o.b. Chicago, base, per lb. .... 2.10c.  
Reinforcing steel bars f.o.b. P'gh mills, base, per lb. .... 2c.  
Rail steel bars, f.o.b. Chicago district mills, base, per lb. .... 2.00c.  
Common iron bars, f.o.b. Chicago, base, per lb. .... 2.00c.  
Refined iron bars, f.o.b. P'gh mills, base, per lb. .... 3.00c.  
Common iron bars, eastern Pa. mill, base, per lb. .... 2.10c.

## Hot-Rolled Flats

Hoops, base, per lb., Pittsburgh. .... 2.40c.  
Bands, base, per lb., Pittsburgh. .... 2.40c.  
Strips, 6 in. and narrower, base, per lb., Pittsburgh. .... 2.40c.  
Strips, 6 in. and wider, base, per lb., Pittsburgh. .... 2.20c.  
Strips, 6 in. and narrower, Chicago. .... 2.50c.  
Strips, wider than 6 in., Chicago. .... 2.40c.

## Cold-Finished Steel

Screw stock and shafting, f.o.b. P'gh mills, base, per lb. .... 2.60c.  
Screw stock and shafting, f.o.b. Chicago, base, per lb. .... 2.60c.  
Screw stock, base, per lb., Cleveland. .... 2.65c.  
Shafting, ground, f.o.b. mill, base, per lb. .... 3.00c.  
Strips, f.o.b. P'gh mills, base, per lb. .... 3.50c. to 3.75c.  
Strips, f.o.b. Cleveland mills, base, per lb. .... 3.40c. to 3.50c.  
Strips, f.o.b. delivered Chicago, base, per lb. .... 3.80c. to 3.90c.  
Strips, f.o.b. Worcester mills, base, per lb. .... 3.90c.

## Wire Products

(To jobbers in car lots f.o.b. Pittsburgh and Cleveland)

Nails, base, per keg. .... 2.65  
Galvanized nails, 1-in. and longer, base plus. .... 2.00  
Galvanized nails, shorter than 1 in., base plus. .... 2.25  
Bright plain wire, base, No. 9 gage, per 100 lb. .... 2.45  
Annealed fence wire, base, per 100 lb. .... 2.60  
Spring wire, base, per 100 lb. .... 3.50  
Galvanized wire, No. 9, base, per 100 lb. .... 3.05  
Galvanized barbed, base, per 100 lb. .... 3.40  
Galvanized staples, base, per keg. .... 3.40  
Painted barbed wire, base, per 100 lb. .... 3.15  
Polished staples, base, per keg. .... 3.15  
Cement coated nails, base per count keg. .... \$1.90 to 2.00  
\*Bale ties, carloads, to jobbers. .... 75, 15 and 5 per cent off list  
\*Bale ties, carloads, to retailers. .... 75, 10 and 6 per cent off list  
Woven wire fence, base, per net ton to retailers. .... \$64 to \$65

Chicago district mill prices are \$2 per ton above the foregoing and Chicago delivered prices are \$3 per ton above the prices f.o.b. Cleveland and Pittsburgh. Birmingham mill prices \$3 a ton higher; Worcester, Mass., mill \$3 a ton higher on production of that plant, and Duluth, Minn., mills \$2 a ton higher; Anderson, Ind., \$1 higher.

\*F.o.b. Cleveland.

## Sheets

Blue Annealed  
(base) per lb.

Nos. 9 and 10, f.o.b. Pittsburgh. .... 2.25c. to 2.35c.  
Nos. 9 and 10 (base) per lb., f.o.b. Chicago dist. mills, .... 2.35c. to 2.45c.

## Box Annealed, One Pass Cold Rolled

No. 28 (base) per lb., f.o.b. Pittsburgh. .... 3.10c. to 3.20c.  
No. 28 (base) per lb., f.o.b. Chicago dist. mill. .... 3.20c. to 3.30c.

## Galvanized

No. 28 (base) per lb., f.o.b. Pittsburgh. .... 4.15c. to 4.25c.  
No. 28 (base) per lb., f.o.b. Chicago dist. mill. .... 4.25c. to 4.35c.

## Tin-Mill Black Plate

No. 28 (base) per lb., f.o.b. Pittsburgh. .... 3.10c. to 3.20c.  
No. 28 (base) per lb., f.o.b. Chicago dist. mill. .... 3.25c. to 3.40c.

## Automobile Body Sheets

No. 22 (base) per lb., f.o.b. Pittsburgh. .... 4.15c. to 4.30c.

## Long Ternes

No. 28 (base) 8-lb. coating, per lb., f.o.b. mill. .... 4.60c. to 4.75c.

## Tin Plate

Standard cokes, per base box, f.o.b. Pittsburgh district mills .... \$5.50  
Standard cokes, per base box f.o.b. Chicago district mills .... 5.60  
Standard cokes, per base box f.o.b. Elwood, Ind. .... 5.60

## Terne Plate

(F.o.b. Morgantown or Pittsburgh)  
(Per Package, 20 x 28 in.)

8-lb. coating, 100 lb. base .... \$11.20	20-lb. coating I. C. .... \$15.50
8-lb. coating I. C. .... 11.50	25-lb. coating I. C. .... 17.00
15-lb. coating I. C. .... 14.35	30-lb. coating I. C. .... 18.35
	40-lb. coating I. C. .... 20.35

## Rivets

Large, f.o.b. P'gh and Cleveland mills, base, per 100 lb., \$2.40 to \$2.50

Large, f.o.b. Chicago, base, per 100 lb. .... 2.65  
Small, f.o.b. Pittsburgh. .... 70 and 10 per cent off list  
Small, Cleveland .... 70 and 10 to 70, 10 and 5 per cent off list  
Small, Chicago .... 70 and 10 to 70, 10 and 5 per cent off list

## Rails and Track Equipment

(F.o.b.)

Rails, standard, per gross ton. .... \$43.00  
Rails, light, billet, base, per lb. .... 1.70c. to 1.75c.  
Rails, light rail steel, base, per lb. .... 1.65c. to 1.70c.  
Spikes, 1/2 in. and larger, base, per 100 lb. .... \$2.80 to \$3.10  
Spikes, 1/2 in. and smaller, base, per 100 lb. .... 3.00 to 3.35  
Spikes, boat and barge, base, per 100 lb. .... 3.25  
Track bolts, all sizes, base, per 100 lb. .... 3.90 to 4.25  
Tie plates, per 100 lb. .... 2.35 to 2.40  
Angle bars, base, per 100 lb. .... 2.75

## Welded Pipe

(F.o.b. Pittsburgh district mills)

Butt Weld			Iron		
Inches	Steel	Galv.	Inches	Black	Galv.
1/2	45	19 1/2	1/2 to 3/4	+11	+39
3/4	51	25 1/2	3/4	22	2
1	56	32 1/2	1	26	11
1 1/4	60	38 1/2	1 to 1 1/2	30	13
1 1/2	62	40 1/2			
Lap Weld					
2	55	43 1/2	2	23	7
2 1/2	59	47 1/2	2 1/2	26	11
3	56	43 1/2	3 to 6	28	13
4	54	41 1/2	7 to 12	26	11
5	53	40 1/2			
Butt Weld, extra strong, plain ends					
1/2	41	24 1/2	2 to 3	61	50 1/2
3/4	47	30 1/2	3/4 to 1	+11	+54
1	53	36 1/2	1	21	7
1 1/4	58	42 1/2	1 1/4	28	12
1 1/2	60	44 1/2	1 to 1 1/2	30	14
Lap Weld, extra strong, plain ends					
2	53	42 1/2	2	23	9
2 1/2	57	46 1/2	2 1/2 to 4	29	15
3	56	45 1/2	4 1/2 to 6	28	14
4	52	39 1/2	7 to 8	21	7
5	45	32 1/2	9 to 12	16	2
11 and 12	44	31 1/2			

To the large jobbing trade the above discounts on steel pipe are increased (on black) by one point, with supplementary discount of 5 per cent and (on galvanized) by 1 1/2 points, with supplementary discount of 5 per cent. On iron pipe, both black and galvanized, the preferentials to large jobbers are 1, 5 and 2 1/2 per cent beyond the above discount.

Note—The above discounts on steel pipe also apply at Lorain, Ohio. Chicago district mills have a base 2 points less. Chicago delivered base 2 1/2 points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point having the lowest rate to destination.

## Boiler Tubes

(F.o.b. Pittsburgh)

Lap Welded Steel		Charcoal Iron	
2 to 2 1/4 in.	27	1 1/2 in.	+18
2 1/2 to 3 in.	37	1 3/4 to 1 1/2 in.	+8
3 in.	40	2 to 2 1/4 in.	2
3 1/4 to 3 1/2 in.	42 1/2	2 1/2 to 3 in.	7
4 to 13 in.	46	3 1/4 to 4 1/2 in.	9

Beyond the above discounts, 5 fives extra are given on lap welded steel tubes and 2 tens on charcoal iron tubes.

## Standard Commercial Seamless Boiler Tubes

Cold Drawn		Hot-Rolled	
1 in.	60	3 in.	45
1 1/4 and 1 1/2 in.	52	3 1/4 to 3 1/2 in.	47
1 1/2 in.	36	4 in.	50
2 and 2 1/4 in.	31	4 1/4, 5 and 6 in.	46
2 1/2 and 2 3/4 in.	39		

Less carloads, 4 points less. Add \$8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tube list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

## Seamless Mechanical Tubing

Carbon under 0.30 base. .... 85 to 87 per cent off list  
Carbon 0.30 to 0.40 base. .... 83 to 85 per cent off list  
Plus usual differentials and extra for cutting. Warehouse discounts range higher.

## Seamless Locomotive and Superheater Tubes

Cents per Ft.		Cents per Ft.	
2-in. O.D. 12 gage. .... 14 1/2		2 1/4-in. O.D. 10 gage. .... 18	
2-in. O.D. 11 gage. .... 15		3-in. O.D. 7 gage. .... 33	
2-in. O.D. 10 gage. .... 16		1 1/2-in. O.D. 9 gage. .... 16	
2 1/4-in. O.D. 12 gage. .... 16		5 1/2-in. O.D. 9 gage. .... 50	
2 1/4-in. O.D. 11 gage. .... 17		5 1/2-in. O.D. 9 gage. .... 52	



# Prices of Iron and Steel Products and Raw Materials

## Ores

### Lake Superior Ores, Delivered Lower Lake Ports

Old range Bessemer, 51.50 per cent iron.....	\$4.55
Old range non-Bessemer, 51½ per cent iron.....	4.40
Mesaba Bessemer, 51.50 per cent iron.....	4.40
Mesaba non-Bessemer, 51.50 per cent iron.....	4.25
High phosphorus iron, 51.50 per cent.....	4.15

### Foreign Ore, per Unit, c.i.f. Philadelphia or Baltimore

Iron ore, low phos., copper free, 55 to 58 per cent iron in dry Spanish or Algerian	9.50c. to 10c.
Iron ore, Swedish, average 66 per cent iron	9.50c.
Manganese ore, washed, 51 per cent manganese, from the Caucasus.....	45c.
Manganese ore, Brazilian or Indian, nominal	42c.
Tungsten ore, high grade, per unit, in 60 per cent concentrates.....	\$11.00 to \$11.50
Chrome ore, Indian basic, 48 per cent Cr <sub>2</sub> O <sub>3</sub> crude, per ton, c.i.f., Atlantic seaboard...	20.00 to 24.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS <sub>2</sub> , New York.....	65c. to 70c.

## Coke and Coal

### (Per Net Ton)

Furnace coke, f.o.b. Connellsville prompt.....	\$2.75 to \$2.85
Foundry coke, f.o.b. Connellsville prompt.....	3.75 to 4.25
Mine run steam coal, f.o.b. W. Pa. mines.....	1.50 to 2.00
Mine run coking coal, f.o.b. W. Pa. mines.....	1.50 to 1.75
Mine run gas coal, f.o.b. W. Pa. mines.....	2.00 to 2.25
Steam slack, f.o.b. W. Pa. mines.....	1.35 to 1.40
Gas slack, f.o.b. W. Pa. mines.....	1.40 to 1.60

## Ferroalloys

Ferromanganese, domestic, 80 per cent, furnace, or seaboard, per ton.....	\$115.00
Ferromanganese, foreign, 80 per cent, f.o.b. Atlantic port, duty paid.....	\$110.00 to 115.00
Ferrosilicon, 50 per cent, delivered.....	\$82.50 to 85.00
Ferrosilicon, 75 per cent.....	145.00 to 147.50
Ferrotungsten, per lb. contained metal.....	1.00
Ferrochromium, 4 per cent carbon and up, 60 to 70 per cent Cr., per lb. contained Cr. delivered.....	11.50c.
Ferrovanadium, per lb. contained vanadium	\$3.50 to \$4.00
Ferrocobalt, 15 to 18 per cent, per net ton.....	200.00

## Spiegeleisen, Bessemer Ferrosilicon and Silvery Iron

### (Per gross ton furnace unless otherwise stated)

Spiegeleisen, domestic, 19 to 21 per cent.....	\$33.00
Spiegeleisen, domestic, 16 to 19 per cent.....	32.00
Ferrosilicon, Bessemer, 10 per cent, \$34.50 to \$35.50; 11 per cent, \$37 to \$38; 12 per cent, \$39.50 to \$40.50; electric furnace ferrosilicon, 10 per cent, \$38; furnace with an advance of \$1 per unit for material above 10 per cent.	
Silvery iron, 6 per cent, \$24; 7 per cent, \$24 to \$25; 8 per cent, \$25.50 to \$26.50; 9 per cent, \$27.50 to \$28.50; 10 per cent, \$29.50 to \$30.50; 11 per cent, \$32 to \$33; 12 per cent, \$34.50 to \$35.50.	

## Fluxes and Refractories

Fluorspar, 85 per cent and over calcium fluoride, not over 5 per cent silica, both gravel and No. 2 lump, per net ton, f.o.b. Illinois and Kentucky mines.....	\$17.50 to \$18.00
Fluorspar, foreign, 85 per cent calcium fluoride, not over 5 per cent silica, c.i.f. Philadelphia, duty paid, per net ton.....	18.00
Fluorspar, No. 1 ground bulk, 95 to 98 per cent calcium fluoride, not over 2½ per cent silica, per net ton, f.o.b. Illinois and Kentucky mines.....	32.50

### Per 1000 f.o.b. works:

	High Duty	Moderate Duty
Fire Clay	\$43.00 to \$46.00	\$40.00 to \$43.00
Pennsylvania.....	48.00 to 50.00	43.00 to 45.00
Maryland.....	43.00 to 46.00	40.00 to 43.00
Ohio.....	43.00 to 45.00	40.00 to 43.00
Kentucky.....	43.00 to 45.00	40.00 to 43.00
Illinois.....	43.00 to 45.00	40.00 to 43.00
Missouri.....	45.00 to 48.00	38.00 to 43.00
Ground fire clay, per ton.....	6.50 to 7.50	

### Silica Brick:

Pennsylvania.....	40.00
Chicago.....	49.00
Birmingham.....	54.00
Silica clay, per ton.....	8.00 to 9.00

### Magnesite Brick:

Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.).....	65.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.).....	40.00

### Chrome Brick:

Standard size, per net ton.....	48.00
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## Bolts and Nuts

### (F.o.b. Pittsburgh, Cleveland, Birmingham and Chicago)

Machine bolts, small rolled threads, .60 and 10 per cent off list	
Machine bolts, all sizes, cut threads.....	50, 10 and 10 per cent off list
Carriage bolts, smaller and shorter, rolled threads, 50, 10 and 10 per cent off list	
Carriage bolts, cut threads, all sizes.....	50 and 10 per cent off list
Eagle carriage bolts.....	65 and 10 per cent off list
Lag bolts.....	60, 10 and 10 per cent off list
Flow bolts, Nos. 1, 2 and 3 heads.....	50 and 10 per cent off list

Other style heads.....20 per cent extra  
Machine bolts, c.p.c. and t. nuts, ½ x 4 in., 45, 10 and 5 per cent off list

Larger and longer sizes.....45, 10 and 5 per cent off list  
Hot-pressed nuts, blank or tapped, square.....4c. off list  
Hot-pressed nuts, blank or tapped, hexagons.....4.40c. off list  
C.p.c. and t. square or hex. nuts, blank or tapped, 4.10c. off list  
Bolt ends with hot pressed nuts.....50, 10 and 10 per cent off list  
Bolt ends with cold pressed nuts.....45, 10 and 5 per cent off list  
Washers.....6c. to 5.50c. off list

\*F.o.b. Chicago and Pittsburgh.

The discount on machine, carriage and lag bolts is 5 per cent less than above for less than car lots. On hot pressed and cold punched nuts the discount is 25c. less per 100 lb. than quoted above for less than car lots.

(Quoted with freight allowed within zone limits)

Semi-finished hex. nuts:  
¾ in. and smaller, U. S. S.....80, 10 and 5 per cent off list  
¾ in. and larger, U. S. S.....75, 10 and 5 per cent off list  
Small sizes, S. A. E.....80, 10 and 5 per cent off list  
S. A. E., ¾ in. and larger.....75, 10, 10 and 5 per cent off list  
Stove bolts in packages.....80, 10 and 5 per cent off list  
Stove bolts in bulk.....80, 10, 5 and 2½ per cent off list  
Tire bolts.....60, 10 and 5 per cent off list

## Semi-Finished Castellated and Slotted Nuts

(Prices delivered within specified territories)

(To jobbers and consumers in large quantities)

	Per 100 Net		Per 100 Net
	S. A. E. U. S. S.		S. A. E. U. S. S.
¾-in. ....	\$0.44 \$0.44	¾-in. ....	\$2.35 \$2.40
¾-in. ....	.515 .515	¾-in. ....	3.60 3.60
¾-in. ....	.62 .66	1-in. ....	5.55 5.80
¾-in. ....	.79 .90	1½-in. ....	8.90 8.90
¾-in. ....	1.01 1.05	1½-in. ....	12.60 12.10
¾-in. ....	1.33 1.42	1½-in. ....	18.35 18.35
¾-in. ....	1.70 1.73	1½-in. ....	21.00 21.00

Larger sizes—Prices on application.

## Cap and Set Screws

(Freight allowed within zone limits)

Milled cap screws.....	80, 10 and 5 per cent off list
Milled standard set screws, case hardened, 80 and 10 per cent off list	
Milled headless set screws, cut thread, 80 and 10 to 80 per cent off list	
Upset hex. head cap screws, U. S. S. thread, 80, 10, 10 and 5 per cent off list	
Upset hex. cap screws, S. A. E. thread, 80, 10, 10 and 5 per cent off list	
Upset set screws.....	80, 10 and 10 per cent off list
Milled studs.....	75 per cent off list

## Semi-Finished Steel, f.o.b. Pittsburgh or Youngstown, per gross ton

Rolling billets, 4-in. and over.....	\$33.50 to \$35.00
Forging billets, ordinary.....	35.50 to 40.00
Forging billets, guaranteed.....	43.50 to 45.00
Sheet bars.....	35.00
Slabs.....	23.50 to 25.00
*Wire rods, common soft, base, No. 5 to ¾-in. ....	45.00
Wire rods, common soft, coarser than ¾-in. ....	\$2.50 over base
Wire rods, screw stock.....	45.00 per ton over base
Wire rods, carbon 0.20 to 0.40.....	3.00 per ton over base
Wire rods, carbon 0.41 to 0.55.....	5.00 per ton over base
Wire rods, carbon 0.56 to 0.75.....	7.50 per ton over base
Wire rods, carbon over 0.75.....	10.00 per ton over base
Wire rods, acid.....	15.00 per ton over base
Skelp grooved, per lb.....	1.80c. to 2c.
Skelp, sheared, per lb.....	1.90c. to 2c.
Skelp, universal, per lb.....	1.90c. to 2c.

\*Chicago mill base is \$47. Cleveland mill base, \$45.

## Alloy Steel

(F.o.b. Pittsburgh or mill)

S. A. E. Series	Bars 100 lb.
Numbers	
2100* (½% Nickel, 10 to 20 per cent Carbon)...	\$2.00 to \$3.25
2300 (3% Nickel).....	4.50 to 4.75
2500 (5% Nickel).....	6.00 to 6.25
3100 (Nickel Chromium).....	5.50 to 5.75
3200 (Nickel Chromium).....	5.50
3300 (Nickel Chromium).....	7.50 to 7.75
3400 (Nickel Chromium).....	6.50 to 6.75
5100 (Chromium Steel).....	3.50
5200* (Chromium Steel).....	7.50 to 8.00
6100 (Chromium Vanadium bars).....	4.25 to 4.50
6100 (Chromium Vanadium spring steel).....	4.00 to 4.25
9250 (Silicon Manganese spring steel).....	3.50
Carbon Vanadium (0.45 to 0.55 Carbon, 0.15 Vanadium).....	4.25 to 4.50
Nickel Chrome Vanadium (0.40 Nickel, 0.50 Chromium, 0.15 Vanadium).....	4.50
Chromium Molybdenum bars (0.80—1.10 Chromium, 0.25—0.40 Molybdenum).....	4.35
Chromium Molybdenum bars (0.50—0.70 Chromium, 0.15—0.25 Molybdenum).....	3.75
Chromium Molybdenum spring steel (1—1.25 Chromium, 0.30—0.50 Molybdenum).....	4.75 to 5.00

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for coal drawn bars is 1c. per lb. higher. For billets 4 x 4 to 16 x 16-in. the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4-in. down to and including 2½-in. squares, the price is \$5 a gross ton above the 4 x 4 billet price.

\*Not S. A. E. specifications, but numbered by manufacturers to conform to S. A. E. system.

## NON-FERROUS METALS

### The Week's Prices

Cents per Pound for Early Delivery							
Copper, New York			Straits Tin (Spot)	Lead		Zinc	
	Lake	Electro- lytic*	New York	New York	St. Louis	New York	St. Louis
June							
17.....	13.75	13.50	56.00	8.32½	8.00	7.35	7.00
18.....	13.87½	13.62½	56.12½	8.30	8.00	7.30	6.95
19.....	13.87½	13.62½	56.17½	8.25	7.90	7.30	6.95
20.....	13.75	13.50		8.25	7.90	7.30	6.95
21.....	13.75	13.50	56.12½	8.25	7.90	7.32½	6.97½
22.....	13.75	13.50	56.50	8.25	7.90	7.35	7.00

\*Refinery quotation; delivered price 1/4c. higher.

#### NEW YORK, June 23.

Copper has had an active week, with prices somewhat stronger. The scarcity of spot tin has forced prices slightly higher on that metal, while both lead and zinc have shown an easier price tendency.

**Copper.**—In the week ended last Thursday the copper market had one of its most active periods in months, but the activity ceased as suddenly as it started, and since Thursday the market has been very quiet, almost dull. Publication nearly two weeks ago of figures showing that stocks of copper at refineries had declined about 25,000 tons was the signal for renewed interest in the market by buyers, who for some time had permitted their own stocks to go below normal. All of the larger consumers came into the market during the brief buying spell and the orders placed are variously estimated at 25,000 to 40,000 tons. In the opinion of some of the larger factors, the higher figure is somewhere near correct. The Western Union Telegraph Co. bought 3,250,000 lb. and there were quite a few orders of 1,000,000 lb. or more. Most of the purchases were to cover immediate and July requirements, there being very little bought for August. This fact makes producers feel rather confident that the strength of the market will be fairly well maintained, as even the consumers who have just bought will have to come into the market again soon. The bulk of the sales was made at prices ranging from 13.62 1/2c. to 13.75c. per lb., delivered. At the height of the buying the principal producers advanced quotations to 13.87 1/2c., but only a little business was done at this level, and in the quietness which followed the rise the price sagged back to 13.75c. Today there were indications that at least one seller was willing to take 13.70c.

**Tin.**—Scarcity of spot tin has held the market in a fairly firm position throughout the past week. Sales during the business week, Monday to Friday, inclusive, were about 500 to 600 tons. On Monday of this week there were purchases of 300 to 350 tons by consumers and today there was good business, about 300 to 400 tons changing hands. Spot Straits sold at 56.50c. today; for July and beyond the price was 56c. to 56.12 1/2c. Most of the tin arriving in this country is to apply on contracts, and comparatively little unsold tin is arriving. This makes for strength in the spot market. While there is a fairly good supply of Chinese tin, 99 per cent, there is virtually no call for it even at prices 1c. per lb. under that quoted on spot Straits. London prices are lower than a week ago, spot standard being quoted at £252 5s., according to today's cables, future standard at £254 7s. 6d., spot straits at £254 12s. 6d. and the Singapore price is £256 10s.

**Lead.**—Following the reduction last week by the American Smelting & Refining Co. from 8.40c. to 8.30c., New York, lead has been quiet. While the price of the leading interest remains at 8.30c., quotations of 8.25c. in the outside market have given an appearance of weakness. Buying is in such small volume that the market presents no unusual features.

**Zinc.**—Prices of zinc have been a little soft during the week but strengthened slightly at the beginning of this week on news of a strike in Belgium. Although this news is unconfirmed it may explain, if true, the

increase in export inquiries which the leading producers have noticed. This prospective export buying is the sole new feature. Domestic consumers show only ordinary interest in the market and are continuing their policy of buying frequently in small lots. Today's price was 7.35c., New York, although 7.30c. is the figure at which possibly business could be done.

**Nickel.**—Ingot nickel remains at 34c. per lb., shot nickel is unchanged at 35c. Electrolytic nickel, 99.75 per cent, is quoted at 38c.

**Antimony.**—Chinese metal for spot delivery is quoted at 16.50c., while for July the asking price is generally 16.75c. These prices are for delivery at New York, duty paid.

**Aluminum.**—There is no change in the price of aluminum, virgin metal, 98 to 99 per cent pure, remaining at 27c. to 28c. per lb., delivered.

**Old Metals.**—The market is again uncertain and trading is slow. Dealers' selling prices are as follows in cents per lb.:

Copper, heavy and crucible .....	13.25
Copper, heavy and wire .....	12.00
Copper, light and bottoms .....	10.75
Heavy machine composition .....	10.00
Brass, heavy .....	8.25
Brass, light .....	7.00
No. 1 red brass or composition turnings ..	9.00
No. 1 yellow rod brass turnings .....	9.00
Lead, heavy .....	8.00
Lead, tea .....	6.75
Zinc .....	5.00
Cast aluminum .....	19.00
Sheet aluminum .....	19.50

### Chicago

JUNE 23.—The metals are quiet and prices show little change. Among the virgin metals zinc has advanced while prices on copper, tin, lead and antimony are unaltered. Old metal prices are unchanged. We quote, in carload lots: Lake copper, 13.87 1/2c.; tin, 57c.; lead, 8.40c.; zinc, 7.40c.; in less than carload lots, antimony, 19c. On old metals we quote copper wire, crucible shapes and copper clips, 10.50c.; copper bottoms, 9.25c.; red brass, 8.25c.; yellow brass, 7.25c.; lead pipe, 6.75c.; zinc, 4c.; pewter, No. 1, 30c.; tin foil, 37c.; block tin, 42c.; all buying prices for less than carload lots.

### Canadian Scrap Market Dull

TORONTO, ONT., June 23.—Trading in iron and steel scrap continues dull. Melters show a preference for small tonnages for immediate needs and, despite the fact the dealers in Toronto and Montreal are ready to close contracts for third quarter, business on future account remains slow. No improvement is reported in foundry activities, the majority of which are operating between 40 and 60 per cent. Electric furnace operators are taking in small shipments, but the demand from this quarter has not reached anything like the demand of two or three years ago. Some business is being done in scrap for export, the bulk of which goes to the United States. During the fiscal year, ended with March last, iron and steel scrap exports from Canada were 65,320 tons, which compares with 89,269 tons for the corresponding period a year ago, and 169,966 tons exported during the twelvemonth ending with March, 1923. While dealers have made purchases slightly below listed prices, none have shown any tendency to reduce their buying price lists, and it is now stated in some quarters that any change is likely to be upward. Dealers' buying prices are as follows:

	Gross Tons	
	Toronto	Montreal
Steel turnings .....	\$9.50	\$9.00
Machine shop turnings.....	9.50	9.00
Wrought pipe .....	7.00	7.00
Rails .....	11.00	12.00
No. 1 wrought scrap .....	12.00	14.00
Heavy melting steel.....	11.00	11.00
Steel axles .....	17.00	17.00
Axles, wrought iron.....	19.00	20.00
Net Tons		
Standard car wheels.....	15.00	15.00
Malleable scrap .....	13.00	15.00
Stove plate .....	13.00	13.00
No. 1 machinery cast.....	17.00	16.00



## PERSONAL

George M. Verity, president American Rolling Mill Co., Middletown, Ohio, was honored at the commencement exercises of Miami University, Oxford, Ohio, by having the honorary degree of doctor of laws conferred on him.

B. P. Wheeler has resigned as assistant to Abraham Korns, general superintendent the Portsmouth, Ohio, works, Wheeling Steel Corporation. Mr. Wheeler has become associated with the Lackawanna works, Bethlehem Steel Corporation, Lackawanna, N. Y.

Clarence E. Walkley, long identified with the hardware trade, has been appointed sales manager of the Merriam Mfg. Co., Durham, Conn., manufacturer of steel cash, bond and office boxes. He was previously with the Peck, Stow & Wilcox Co. and H. D. Smith & Co.

John T. Boll, who has been assistant manager in the wire sales division, Wheeling Steel Corporation, has been appointed manager of that division.

Ernest Twigg, mechanical superintendent Landers, Frary & Clark Co., New Britain Conn., will sail on July 4 for England, France, Belgium, Germany and Holland.

John A. Denholm, vice-president Wickwire Spencer Steel Corporation until its reorganization, and since then in charge of sales of hardware products, has resigned. He had been with the company and its predecessor, the Wright Wire Co., during the past 26 years. Mr. Denholm has not announced his plans for the future.

Fielder I. Hiss, formerly of the Crocker-Wheeler Co., has joined the organization of the Triumph Electric Co., Cincinnati, as chief engineer and assistant sales manager. He has had a long and varied experience in the motor field. He was born in Baltimore and was educated abroad, graduating from Finsbury College, London, England, in 1902 as an electrical engineer. His first connection with the industry was as assistant to Silvanus P. Thompson. Later he was designing engineer for Johnson & Phillips, London. Returning to this country in 1906 with the Westinghouse Electric & Mfg. Co., East Pittsburgh, he was engaged in development work in the railroad power and industrial division until 1913, when he joined the Crocker-Wheeler Co. as assistant chief engineer, becoming assistant to the late Dr. Wheeler and finally manager of the small motor department.

H. R. Rowland has been appointed Pittsburgh district sales manager, A. M. Byers Co., succeeding S. K. Turner, who resigned recently. Mr. Rowland has been identified with the A. M. Byers Co. for the past 10 years, all of that time in the general sales office in Pittsburgh.

W. B. McSkimmon has been chosen president of the Union Twist Drill Co., Athol, Mass., succeeding the late J. A. McGregor. Mr. McSkimmon was one of the founders of the company and has been an executive in it since it was formed 20 years ago.

A. R. Kelso, formerly master mechanic of production of the Hudson Motor Car Co., Detroit, has been appointed works manager of the Muskegon (Mich.) plant of the Continental Motors Corporation.

E. J. Fullam, secretary-treasurer, and W. F. Slomer, general sales and service manager of the Fellows Gear Shaper Co., Springfield, Vt., sailed June 9 on the Aquitania on a business trip covering England, France, Ger-

many, Belgium, Switzerland and Italy. They expect to return about the second week in August.

Dr. Wheeler P. Davey, of the research laboratory, General Electric Co., will deliver a series of lectures on "Crystal Structure and Its Applications" at the summer session of the graduate school in the physics department of the University of Michigan. Laboratory work will include the use of a General Electric crystallographic equipment, by which crystal structure is determined through X-ray analysis. Dr. Davey conducted a course in this work at the graduate school of Pennsylvania State College last summer.

Harry B. Parker, vice-president Albion Malleable Iron Co., has been honored in the naming of a hotel to be known as Parker Inn, for the construction of which the citizens of Albion, Mich., recently raised \$275,000. The neighboring city of Lansing is shortly to build a hotel at a cost of \$1,000,000, which will be named for R. E. Olds, automobile manufacturer. Holland, Mich., recently opened its new hotel, "The Warm Friend Tavern," named in recognition of its largest industry, the Holland Furnace Co.

G. W. Eichhoff, formerly district manager in charge of the Chicago office of the Cleveland electric tramrail division of the Cleveland Crane & Engineering Co., Wickliffe, Ohio, has been appointed sales specialist in charge of tramrail sales to the ceramic and paper industries. H. T. Florence was appointed specialist in the rubber industry.

Thomas W. Oberhauser, Pittsburgh district sales manager Wheeling Steel Corporation, until May 1, when the company consolidated its Pittsburgh office with the Wheeling district sales office, has been appointed assistant manager of the pipe sales division, with headquarters in Wheeling.

J. A. Henry has been appointed Detroit district manager of sales, Wheeling Steel Corporation, succeeding J. O. Tucker, who recently was promoted to the position of assistant general manager of sales, with headquarters in Wheeling. Mr. Henry was in the Detroit office as assistant to Mr. Tucker. Previously he had been with the Warren Iron & Steel Co., Warren, Ohio, and before that with the American Rolling Mill Co. and the Whitaker-Glessner Co.

Robert E. Clingan has been elected president of the Bock Bearing Co., Toledo, Ohio, of which he has been the operating head for six years. W. S. Quinlan, Cleveland, was elected vice-president, and C. G. Steinbicker secretary-treasurer. Control of the Bock company was held for several years by the Standard Parts Co. through common stockholders. A reorganization was effected when the latter was liquidated.

J. Leonard Replogle sailed for Europe recently and will remain for some weeks on the Continent, returning in August.

Charles A. Haines, Dodge-Haley Co., Cambridge, Mass., was reelected president of the New England Iron and Hardware Association at the annual meeting held Thursday evening at Young's Hotel, Boston, and Edward R. Brayton, Belcher & Loomis Hardware Co., Providence, R. I., vice-president. The following constitute the board of directors: Charles A. Adams, John B. Varick Co., Manchester, N. H.; C. D. Alexander, Emery, Whitehouse Co., Portland, Me.; R. M. Boutwell, Standard Horseshoe Co., Boston; William H. Bowe, Herrick Co., Boston; F. Marsena Butts, Butts & Ordway Co., Boston; E. R. Drayton, Belcher & Loomis Hardware Co., Providence, R. I.; Franklin E. Bragg, N. H. Bragg & Sons, Bangor, Me.; Frank F. Chase, Chase, Parker & Co., Boston; G. M. Condon, Condon & Carpenter Co., Providence, R. I.; M. B. Damon, Fitchburg Hardware Co., Fitchburg, Mass.; Clarence C. Dodge, George F. Blake Mfg. Co., Cambridge, Mass.; George M. Gray, Peter Gray & Son, Inc., Cambridge; Charles A. Haines,

Dodge-Haley Co., Cambridge; Charles W. Henderson, Arthur C. Harvey Co., Boston; Robert H. Sanderson, E. P. Anderson Co., Cambridge. George J. Mulhall was reelected treasurer and clerk of the association.

Walter Wood, of R. D. Wood & Co., Philadelphia, returned recently from a stay of some weeks in Europe.

J. Kent Smith, who removed to the United States a few weeks ago after many years' residence in Sheffield, England, has established a metallurgical consulting office in Detroit, his address being 8100 Jefferson Avenue E. One of his recent undertakings is in connection with molybdenum and molybdenum steel.

James Craig, formerly connected with the Charles Walsley Co., Quebec, Canada, recently was appointed foundry superintendent of the Busch-Sulzer Brothers-Diesel Engine Co., St. Louis.

L. P. Ross, vice-president Replogle Steel Co., Wharton, N. J., sails from New York early in July and will spend two or three months in Great Britain and Continental countries, his itinerary including trips to a number of iron and steel manufacturing centers.

Henrik Owensen has been appointed chief engineer of the Youngstown Sheet & Tube Co., Youngstown, succeeding Klaus Sollie, who died April 19. Mr. Owensen had been assistant chief engineer of the company.

Robert Bentley, Youngstown, Ohio, president Ohio Iron & Steel Co., a holding concern, and a director in the Youngstown Sheet & Tube Co., has been elected president of the Community Corporation, the governing agency for 30 charitable and philanthropic organizations at Youngstown. He succeeds as president Henry M. Garlick, identified for many years with the industrial development of the Mahoning Valley.

Norris J. Clarke, president Lake Erie Bolt & Nut Co., Cleveland, will sail for Europe June 27, and will spend two months in England, Scotland and France, devoting his time to both business and pleasure.

Charles M. Bullard, who has had long experience as paper mill engineer, has been appointed representative in central and northwestern Wisconsin by the Uehling Instrument Co., maker of power plant instruments. His office will be at 912 Washington Street, Appleton, Wis.

C. H. Hobbs, vice-president Detroit Seamless Steel Tube Co., Detroit, recently bought by J. W. Hubbard, becomes president and general manager, succeeding A. A. Templeton. Mr. Hubbard, as noted in THE IRON AGE of June 11, is chairman of the board. Otherwise the organization remains the same. Mr. Hobbs, born in Indianapolis in 1882 and educated in Chicago, has been in the steel business since he left school in 1901. From then until 1907 he was connected with steel companies in Chicago. In 1908 he went with the Chicago district office of the Lackawanna Steel Co., remaining until 1917, when he became Detroit district sales manager for the Lackawanna company. He joined the Detroit Seamless Steel Tube Co. in 1922.

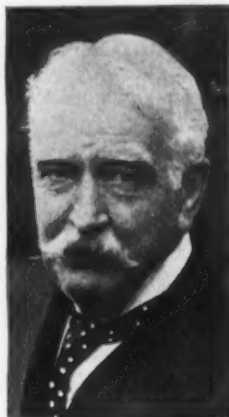
Elliott A. Allen has been appointed district manager of sales for the Timken Roller Bearing Co. in New England territory. His office will be at 1107 Commonwealth Avenue, Boston.

N. M. Rice, for the past five years purchasing agent, New York, New Haven & Hartford Railroad, has been made a vice-president of that corporation, in charge of purchases and stores.

George A. Moriarty, Cambridge, Mass., mechanical superintendent New York, New Haven and Hartford Railroad, with headquarters at Boston, has been made general mechanical superintendent, with headquarters at New Haven, Conn. F. E. Balda succeeds Mr. Moriarty.

## OBITUARY

JOHN H. HAYWARD, remembered as the "father of automatic buckets," founder of the Hayward Co., maker of buckets, 50 Church Street, New York, died at



J. H. HAYWARD

Teaneck, N. J., on June 14. He was born in New York in 1847. After graduating from a military school he spent several years in banking and was a member of the New York Produce Exchange. In about 1873 he moved to Staten Island, where a fast friendship grew with Dr. Johnson, an inventor, the outcome of which was the development of the first automatic bucket. Later the Manhattan Dredging & Elevating Co. was formed and Mr. Hayward became its general manager. When the company went out of business he engaged in building buckets himself. The first Hayward bucket was

known as an "orange peel" and was built in a shop located on Washington Street, New York. This and other types designed by Mr. Hayward were so successful that contractors immediately adopted them and since that time their field of usefulness has broadened until today they are found in remote corners of the world and play a prominent part in practically every industry. At the time of his death Mr. Hayward was vice-president and treasurer of the Hayward Co. and a member of the Engineers' Club and the Machinery Club, New York.

E. A. UPSTILL, aged 63, president Keystone Coal & Coke Co., Cleveland, died at his home in Cleveland Heights, June 16, following a short illness.

CHARLES S. ARMSTRONG, auditing accountant of the Hammond Iron Works, Warren, Pa., tank manufacturer, died at his home in that city on June 19.

P. J. BECKER, aged 55, president Just Right Mfg. Co., Chicago, dropped dead at a Scranton, Pa., hotel, June 16.

WILLIAM CLASMANN, noted mechanical engineer and inventor of refrigerating machinery, died at his home in Milwaukee on June 16 at the age of 60 years. He formerly was associated with the DeLaverne Refrigerating Co. and the Vilter Mfg. Co., and for 15 years was chief engineer Pabst Brewing Co., Milwaukee, retiring in 1915 to engage in the general sales engineering business.

HENRY C. EBERT, formerly president of the Cincinnati Car Co., Cincinnati, died suddenly in Chicago on June 9. He had been a resident of the latter city since 1914. He is survived by his widow and one daughter.

Automobiles exported from the United States in the last five calendar years to six countries of northern Europe aggregated 70,487 cars, valued at \$55,827,029. This represents 11.1 per cent of the total American exports of 635,464 cars in those five years. The destinations included Denmark, Norway, Sweden, Belgium, Holland and Germany. The largest exports to those six countries occurred in 1923, but the largest total exports to world markets occurred in 1924, according to Commerce Reports.



## Pessimism Pervades Foreign Reports

(Continued from page 1857)

livered consumers this country at quite 20s. (\$4.86) a ton less than British makers ask.

### Only the Rail Mills Are Active

It is, however, in the heavy steel trades that the greatest effect is being felt, owing to the virtual stagnation at the shipyards throughout the country, and for this reason naturally plate rollers are hard up for business. Rail mills are busy in some cases, owing to the energetic programs of the railroad companies, the London, Midland & Scottish Railway having placed orders for 40,000 tons of rails and accessories, while a welcome feature is the securing of 25,000 tons of 80-lb. rails for South Africa.

Considerable interest has been displayed in this latter connection. It was reported originally that 150,000 tons was sought in anticipation of the formation of an International Rail Syndicate, but since this has not yet matured, South Africa withdrew the inquiry and replaced it with a much smaller tonnage, part of which has gone to British works, while about 18,000 tons of 60-lb. rails is expected to go to Belgium. The general British price on 80-lb. rails is £8 10s. (\$41.30) f.o.b., but this order is said to have been taken at about £6 12s 6d. (\$32.20), f.o.b., which is a very big drop.

## TRADE INCREASINGLY DULL

### French Export Market Quiet—Semi-Finished Steel Somewhat Active

PARIS, FRANCE, June 12.—The market is again completely swayed by exchange. In the meantime inland trade is extremely quiet and not much better for export, where prices, both in British currency and in francs, still are falling.

**Pig Iron.**—Phosphorous pig iron is quiet. Founders are going to the extreme limit of their supplies before passing orders. The O. S. P. M. has forbidden any sale for July. Inland prices are unchanged; within the last few days quotations f.o.b. Antwerp read: 335 to 340 fr. (\$16.50 to \$16.75) for pig iron No. 3.

Hematite quotations decrease from week to week; for heavy tonnage dealings are closed around 405 to 410 fr. (\$19.95 to \$20.20) per ton at works; below 200 tons there is an increased rate of 5 fr. (25c.), 10 fr. (50c.) and even 15 fr. (75c.). In the Center region sales have been made at 415 fr. (\$20.45) delivered; export is slightly better toward Italy.

**Semi-Finished Products.**—This is the best of all the markets; new inland orders, however, are neither numerous nor very important. For export, British buying proposals are always lower, but both Lorraine and Luxemburg sellers are much less disposed to grant concessions. In spite of this, prices are lower. Quotations, basic steel: blooms, £4 17s. to £4 17s. 6d. (\$23.57 to \$23.69); billets, £5 1s. 6d. to £5 2s. (\$24.66 to \$24.78); largets, £5 4s. to £5 4s. 6d. (\$25.27 to \$25.39). Some Belgian billets have been sold to the Midlands at £6 (\$29.16) delivered and some largets at £6 2s. 6d. (\$29.96).

**Rolled Steels.**—Transactions cover only resupplying and do not require heavy tonnage. Inland basis prices are not modified. Merchant steel has been sold to a railroad company for 5000 kg. round bars of 50-mm. (2-in.) diameter in "A" steel, 4 to 5 m. (13 to 16 ft.) long, at 70.40 fr. per 100 kg. (1.55c. per lb.); 6000 kg. square bars of 100 mm. (3.937 in.) in "D" steel, 3 to 6 m. long, at 75.40 fr. per 100 kg. (1.66c. delivered Center. Export business is slack. Belgium, however, maintains its rates and Lorraine and Luxemburg are less disposed to grant concessions. Beams are quoted: f.o.b. Antwerp, £5 5s. 6d. to £5 7s. (1.14c. to 1.16c.); bars, £5 11s. 6d. to £5 12s. (1.21c. to 1.22c.).

**Rails.**—The State Railroads have asked for 5000 tons rails in "R" steel, 46 kg. per meter (92 lb. per

yard), delivery before Feb. 28, 1926, at latest, and in measure of the needs of the railroad. The lowest price tendered was 517.85 fr. (\$25.52), at works Volklingen (Sarrel). Other bids range from 524.05 fr. (\$25.82) to 580 fr. (\$28.57). It is not known yet who will get the order, as it is necessary first to calculate the freight to the point of use.

**Sheets.**—Sales conditions are unchanged. For heavy sheets, and for orders of above 50 tons, quotations in the Center region: 5 mm. (No. 6½ gage) and above, 76 to 80 fr. per 100 kg. (1.67c. to 1.76c. per lb.); 4 mm. (No. 9 gage) and over, 84 to 86 fr. (1.85c. to 1.89c.); 2 mm. (No. 14 gage) and for 20 tons, 101 fr. (2.22c.); less than 2 mm., 112 fr. (2.46c.); 1.5 mm. (No. 16½ gage), for 5 tons, 113.60 fr. (2.50c.); deliveries in three months for sheets of 2 mm. and below, less than two months for sheets of 3 mm. (No. 11½ gage) and above. For export, f.o.b. Antwerp, in basic steel, 5 mm. sheets and above, £6 13s. to £6 14s. (1.45c. to 1.46c.); 4 mm., £6 18s. 6d. to £6 19s. (1.50c. to 1.51c.); 3 mm., £7 3s. 6d. to £7 4s. (1.55c. to 1.56c.); 2 mm., £8 12s. 6d. to £8 15s. (1.87c. to 1.90c.); 1.5 mm., £9 12s. 6d. to £9 15s. (2.09c. to 2.12c.); 1 mm. (No. 20 gage), £9 17s. 6d. to £10 (2.14c. to 2.17c.); ½ mm. (No. 26 gage), £11 17s. 6d. to £12 (2.57c. to 2.60c.); large flats, £6 12s. 6d. to £6 13s. 6d. (1.44c. to 1.45c.).

**Foundry.**—Only the works making specialties continue occupied; others look for work, often in vain. A foundry of the West has taken an order for 37,500 tons of 100-mm. (3.937 in.) cast iron water pipe at 105.50 fr. per 100 kg. (\$52 per gross ton).

## MARKET DISORGANIZED

### Exchange Situation Worries Belgian Iron and Steel Makers

BRUSSELS, BELGIUM, June 5.—The Belgian metallurgical market seems quite disorganized by fluctuations of foreign exchange and by the economic and political developments. As in France, the rise of sterling has not stimulated foreign demand, so that prices, whether in British currency or francs, tend to decrease, with the exception of pig iron. Business has not been quite slack, a number of speculators having had to cover themselves; the bigger works have work for the next six or eight weeks. Lorraine competition seems to have lost its sharpness and Luxemburg works have more or less maintained their prices.

**Wages.**—After having taken back their acceptance for the decrease of 5 per cent as of May 1, and again made their threat of a strike, in a number of firms of the Charleroi Basin the men had hoped to intimidate the employers. These latter immediately answered by posting a lockout bill for June 16, and the works threatened by the strike are taking the necessary dispositions to stop their furnaces. This firm and decided attitude has had the effect that the threatened strike has been held back until June 15.

**Pig Iron.**—The tension of change has made a slightly firmer tone of franc quotations; British offers remain low; nevertheless, they have a tendency to meet the prices of Lorraine and Luxemburg sellers. Belgium asks very nearly the same rates. Pig iron No. 3 is quoted at 337.50 to 340 fr. (\$16.42 to \$16.54). Basic iron is hard to obtain in Belgium, yet a few foreign offers come up around 330 to 332.50 fr. (\$16.05 to \$16.18).

**Semi-Finished Products.**—Market is stationary. Lorraine does not accept the Antwerp rates, though they have decreased once more this week. Lorraine and Luxemburg alone compete for orders at following prices: blooms, 465 to 470 fr. (\$22.62 to \$22.87) or £4 17s. 6d. to £4 18s.; billets, 495 to 500 fr. (\$24.08 to \$24.33) or £5 2s. to £5 2s. 6d.; largets, 510 to 515 fr. (\$24.80 to \$25.05) or £5 4s. to £5 4s. 6d.

**Iron.**—This department is completely slack and depressed. The stream of orders is quite insufficient to keep the works occupied, with the result that the greater part of them stop work several days per week. Prices are weak, around 560 to 580 fr. (\$27.25 to

\$28.22) inland; £5 12s. 6d. to £5 13s. 6d. (\$27.34 to \$27.58) export, for No. 3. For No. 4, prices remain extremely high, for satisfactory grades are rare; quotations on the home market: 750 to 775 fr. (36.50 to \$37.70); for export, £7 7s. 6d. (\$35.85).

**Finished Steel.**—Hesitating, with prices nominal. Belgium shows more resistance than Lorraine, which, as well as Luxemburg, are less disposed to grant new concessions. It is supposed that the stabilization point will be around £5 10s. f. o. b. Antwerp. For beams the inland price is 510 fr. (1.11c. per lb.) and for export, £5 7s. (1.16c. minimum). Bars are quoted at 540 fr. (1.17c.) or £5 12s. Rods have fallen to £6 5s. to £6 5s. 6d. (1.36c. to 1.37c.), as well as wire rods, quoted at £6 1s. to £6 2s. (\$29.40 to \$29.64).

**Sheets.**—Market is weak and prices discussed are nominal. French and German competition give the tone to the market in Antwerp. The medium weights are somewhat more resisting, but light sheets are less well disposed. Inland quotations for sheets of 5 mm. (No. 6½ gage) and above: 660 to 665 fr. (1.43c. to 1.44c.); sheets of 3 mm. (No. 11½ gage), 715 to 727 fr. (1.55c. to 1.58c.); sheets of 2 mm. (No. 14 gage), 840 to 850 fr. (1.82c. to 1.85c.); sheets of 1.5 mm. (No. 16½ gage), 920 fr. (2c.); sheets of 1 mm. (No. 20 gage), 970 to 980 fr. (2.11c. to 2.13c.); sheets of 0.5 mm. (No. 26 gage), 1100 to 1125 fr. (2.39c. to 2.44c.). F.o.b. Antwerp, sheets of 5 mm. and above are quoted: £6 14s. to £6 15s. (1.45c. to 1.46c.); sheets of 4 mm., £6 19s. 6d. (1.51c.); sheets of 3 mm., £7 3s. 6d. to £7 5s. (1.55c. to 1.57c.); sheets of 2 mm., £8 15s. (1.90c.); sheets of 1.5 mm., £9 15s. (2.12c.); sheets of 1 mm., £10 (2.17c.); sheets of 0.5 mm., £12 2s. 6d. (2.60c. to 2.63c.).

**Scrap.**—Market is weak, transactions rare and prices nominal. Heavy scrap is quoted 300 to 310 fr. (\$14.60 to \$15.08); scrap for open-hearth furnaces, 290 to 295 fr. (\$14.11 to \$14.35); scrap for blast furnaces, 260 to 270 fr. (\$12.65 to \$13.14); shavings, 215 to 225 fr. (\$10.46 to \$10.95); old mechanical pig iron, first choice 350 to 370 fr. (\$17.03 to \$18).

## CONDITIONS NOT GOOD

### Iron and Steel Industry in Luxemburg Languishing

LUXEMBURG, June 5.—The situation of the market did not improve during April; the wavering observed at the beginning of the month has progressed steadily, bringing with it a noticeable depression on the quotations. The prospect of a rise in wages, in the price of coal and coke, the uncertainty prevailing with regard to the economic and political matters, have strengthened the customers' hesitation, although there are some really pressing needs for buying. Concessions on prices have been frequent.

For export, our iron masters meet with certain trouble on the American market, where today they meet the efforts of local producers. A heavy fall in demand from the Far East is also noted, particularly from Japan, by reason of the financial crisis. On the contrary, the German market has remained firm and this resistance compensates somewhat for the high duties.

At the end of May the market is still wavering and the grand-ducal exporters are hit hard by the fierce competition of the Lorraine works. Yet within the last few weeks Luxemburg has found a way of getting good bookings.

Pig iron quotations (Belgian currency) are as follows: No. 3, 335 to 340 fr. (\$16.30 to \$16.54), and basic iron, 325 to 335 fr. (\$15.81 to \$16.30).

### Export Prices Lower

Export demand for semi-finished products is not great; prices, therefore, have fallen. In Belgian francs: blooms (basic), 460 to 465 fr. (\$22.39 to \$22.62); billets, 490 to 495 fr. (\$23.84 to \$24.09); largets, 505 to 510 fr. (\$24.57 to \$24.81). F.o.b. Antwerp, blooms are quoted £4 18s. to £4 19s. (\$23.82 to \$24.06); billets, £5

2s. 6d. to £5 3s. 6d. (\$24.90 to \$25.15); largets, £5 4s. to £5 5s. (\$25.27 to \$25.51).

In the steel group, Luxemburg tries to maintain the prices fiercely fought for by Lorraine. Beams are quoted: £5 7s. to £5 8s. (1.16c. to 1.17c. per lb.); bars, £5 12s. to £5 13s. (1.21c. to 1.22c.); wire rods, £6 1s. 6d. (\$29.52); rods, £6 5s. 6d. (1.36c. per lb.).

Luxemburg offers with regard to sheets are not numerous; in Antwerp the competition reigns particularly between French and Germans. Quotations are as follows: sheets of 5 mm. (No. 6½ gage) and above, £6 15s. to £6 16s. (1.36c. to 1.37c.); 4 mm. (No. 9 gage), £7 to £7 1s. 6d. (1.52c. to 1.54c.); 3 mm. (No. 11½ gage), £7 6s. to £7 6s. 6d. (1.58c. to 1.59c.); 2 mm. (No. 14 gage), £8 15s. (1.90c.); 1½ mm. (No. 16½ gage), £9 15s. (2.12c.); 1 mm. (No. 20 gage), £10 (2.17c.); ½ mm. (No. 26 gage), £11 12s. 6d. (2.52c.); large flats, £6 15s. (1.46c.).

### Dunkirk as a Port of Outlet

Luxemburg has placed good deals in South America, the total of which amounts to nearly 300,000 tons. Although, geographically, Dunkirk (France) is further from Luxemburg (City) than Antwerp (Belgium), Luxemburg is going to give the preference to the French port for the export of her metallurgical products, for the following reasons: The East and North Railroad companies have granted to Luxemburg the parity with regard to freight fares to Dunkirk as if it were to Antwerp. The Nord Railroad company has given to the exporters the disposal of a maritime station holding 1800 cars, in which the merchandise awaits the arrival of the steamer; in consequence, expenses for unloading, carting and reloading are avoided, the trucks being emptied directly on board. Moreover, the expenses for loading on board are markedly higher in Antwerp than in passage through Dunkirk.

## POLISH INDUSTRY POOR

### Iron and Steel Works Operating at Low Rate—Syndicate Proposed

WARSAW, POLAND, June 7.—As a result of railroad rate reductions, tax abatements and other official measures, Poland's badly depressed metal industries show signs of improvement. Industry as a whole is still suffering from a typical deflation crisis, expressed last year and in the first months of this in a heavy passive trade balance. Of late the number of unemployed has slightly decreased. The newest railroad rate reductions, designed to restore export, vary between 12 and 64 per cent. The customs tariff of June, 1924, has been partly revised in a strongly protectionist direction; and the turnover tax on certain export products has been reduced.

Metal-consuming finishing industries mostly report improvement. The locomotive works are operating with only 65 per cent of their full quota of employees, but even this is better than the figure of last winter. The railroad passenger car works have orders until the end of the year; freight car works, until about August. Motor works, reporting that they cannot compete with German and other rivals, are threatened with collapse; and most of the agricultural machinery shops are working only four days a week. A Posen firm (Cegielski) has obtained considerable Russian orders for agricultural machinery; and in general Russia is re-entering the Polish market as buyer.

Heavy iron and steel industry reports are extremely unfavorable regarding 1924. Only 34,000 persons were engaged in smelting at the end of the year, as against 52,000 a year earlier. The main cause of the crisis was the stoppage of German buying, which had attained considerable dimensions during the Ruhr crisis of 1923. Prices of Polish iron for Germany were cut 20 per cent, without any result.

Since January negotiations have been held for the creation of an all-Polish iron syndicate, but no agreement has been so far attained. The chief difficulty is the fixing of the production quotas of individual corporations in the total output and sale.



## Surface Cracks in Rolling Steel

(Continued from page 1837)

point is virtually equivalent to that claimed by some steel makers, viz., that, the less an ingot departs from a cube in its over-all dimensions, the better it is likely to roll. They found support for their claim in the short ingot butt which often rolls better than the remainder of the heat, which ability they ascribe to its shape, while it is due in part and perhaps the larger part to its freedom from non-metallics which freedom is largely due to the time afforded for their formation, coalescence and escape from the metal while in the ladle. The metal in a butt, being the last of the heat to be teemed, has the longest time for its sonims to escape and is therefore the cleanest of the heat even though the sonims rising from the metal below while in the ladle have to pass up through it. In so doing they coalesce with and take along, at somewhat accelerated speed, any others which they touch, cleaning the metal by so much.

3. *Ingot with Larger End Up:* For a given weight of ingot this gives a smaller mass at the bottom which, as shown by paragraph 1, favors freedom from snakes. Another favoring circumstance is that the ingot, as it shortens because of contraction due to cooling, tends to settle down and so, in a measure, to preserve contact with the mold which thereby continues to support it and also, by continuing contact or close proximity, to cool it more rapidly and so to increase the strength of the solidifying shell. When the smaller end of the ingot is up, this latter condition does not obtain, but the contact of ingot with mold is broken earlier.

4. *Mold Closed and Rounded Within at Bottom:* Such a mold further lessens the mass of the ingot at the bottom which therefore tends to cool more rapidly and so strengthen the shell. Such a mold also prevents the formation of a fin on the bottom of the ingot, a further advantage referred to later. It must of course comply with paragraph 3 to allow the ingot to be extracted unless made in two or more parts.

5. *Mold More Massive at the Bottom:* Such a mold tends to make a thicker and stronger shell for two reasons: First, it will be more slowly heated by the molten steel and hence will expand less rapidly and therefore remain in contact with the shell longer. Second, it will also cause in some degree more rapid cooling of the steel and so strengthen the shell.

6. *Fluted Mold:* A fluted mold usually has eight sides. The ingot shell which forms within it follows the expanding mold as it is heated, better than that in a rectangular mold having flat surfaces, or in a cylindrical mold. This is favored by the large number of corners and hence by the smaller area of each curved side between. Molds with longitudinal corrugations are considered as included under this item.

7. *Sand Mold:* A sand mold does not expand from the heat of the metal as an iron mold does. Indeed, the high heat may conceivably, by causing the silica sand to swell, make the ingot cavity contract so as to be slightly smaller. In any case the mold continues to support the shell so that the tendency of the ingot to be snaked is lessened.

8. *Cast at Low Temperature:* This causes the shell to form rapidly so that it may be strong enough not to be burst by the pressure. It also causes the chill dendrites to be smaller and less clearly defined as referred to later. The limiting condition of this requirement is that no important skull be left in the ladle.

9. *Cast Slowly:* This may afford time enough for the shell to become sufficiently strong to withstand the pressure. For this a small nozzle,

one inch or less in diameter, requiring 4 or 5 min. to teem a 3-ton ingot, may be employed. This precaution is demanded when the steel is cast hotter than specified in paragraph 8.

These nine casting requirements may be divided into three classes: (1) To lessen the intensity of the physical causes of snakes as exemplified in paragraphs 1, 2, 3 and 4; (2) To make the shell strong enough to withstand the ferrostatic pressure, paragraphs 5, 8 and 9, and (3) to provide that the thin shell first formed by the freezing steel shall follow the mold as it expands without being unduly stretched, paragraphs 6 and 7.

In a general way it may be said that any killed steel ingot should be so made that the upper part remains liquid longer than the lower. When the purpose is to prevent or diminish the size of the pipe, it should be accomplished by retarding the freezing of the upper part as by the use of a hot-top and in other well known ways. But to minimize or prevent the formation of snakes, this difference in time of solidification should be brought about by hastening cooling of the bottom part as set forth in paragraphs 3, 4, 5 and 9. In particular cases a compromise between the two methods may be best.

From the foregoing it will be seen that larger ingots are more liable to have snakes, as well as some other defects not herein considered, than smaller. It is for large forging ingots of over 10 tons weight that fluted molds are particularly employed.

Cylindrical ingots of any considerable size, say over 20 in. in diameter, are particularly liable to be cracked longitudinally from the same causes which make snakes because, the circle being the shortest line to inclose a given area, the frozen shell cannot follow the mold at all. It will therefore shrink away from the mold more quickly than with any other shape of ingot, and is therefore likely to be split by the ferrostatic pressure because it is hot and therefore weak. As with snakes these splits are usually in the lower part of the ingot.

### Quality and Snakes

To illustrate the effect of indifferent quality in causing snakes the writer's first experience with them some years ago will serve. We had been making acid steel with 0.12 to 0.15 per cent carbon for boiler plates, casting it into slab ingots which were rolled direct from ingot to finished plate at one operation on a 2-high reversing plate mill. The ingots were 8 in. x 20 in. and 10 in. x 24 in. in cross-section and there was no notable trouble from snakes, though the plates did not scale as freely during rolling as might have been wished.

Then we received orders for larger plates for the protective decks of cruisers for the new navy which called for larger ingots up to 13 in. x 48 in. in cross-section and, to get the tensile strength required, the carbon had to be raised to 0.25 or 0.30 per cent which made it more difficult to get the proper effervescence required in the molds.

Snakes appeared on some of the plates which therefore looked badly. They were not serious physically being so shallow, when not wholly smoothed out by rolling, that tensile test pieces in which they ran across the pulled section frequently broke elsewhere than at the snake. Nevertheless they were enough to cause the rejection of some of the plates containing them. Had the ingots been first slabbed down and then reheated and rolled into plates, the snakes would have been for the greater part, if not wholly, obliterated.

Much study and observation at last revealed the cause of the snakes to be primarily the large surfaces of the molds, because of the expansion and the ferrostatic pressure; metal of inferior quality with a tendency to red-shortness or hot-shortness was snaked. With the smaller ingots having smaller surfaces and less ferrostatic pressure, the quality of the steel was good enough to endure the stretching required without often being snaked.

The cure with the large ingots was to clean the bath metal better of oxides, particularly of silica ( $\text{SiO}_2$ ) by

the presence of manganese in the bath metal, either residual or added, and prolonged boiling without an undue excess of ore though we had to use enough of the latter to obtain proper effervescence in the molds. The main thing we found desirable was to have in the unfinished steel at the end, before the final additions, some residual manganese, say 0.02 or 0.03 per cent, which proved that that element had been present in sufficient quantity through the working period. All the rest of the manganese contained in the materials charged, chiefly in the scrap, or added in cases where there had been none of that in the original charge remaining, had been oxidized continuously throughout the melting operation and its oxide had fluxed the silica formed by the oxidation of the silicon in the charge.

The silicates of iron and manganese so formed were visible and the particles thereof coalesced and left the metal in the now well-understood manner. So, when there was no manganese in the metal, no more oxide was formed and the elimination of silica practically

ceased. The silicon (so reported by the chemist) in the good steel was not over 0.01 per cent while it had been twice that or more in the snaky steel.

When the unfinished steel in the furnace was found to contain no manganese, a little spiegel or ferromanganese to give about 0.03 per cent of that element was added. Time was then allowed for the sonims then formed to escape and the boil to assume the proper activity before the final additions were made. This method not only avoided snakes but caused the scale to come off in large sheets in rolling, leaving a clean, sound surface of good appearance and also gave better ductility in the tensile test.

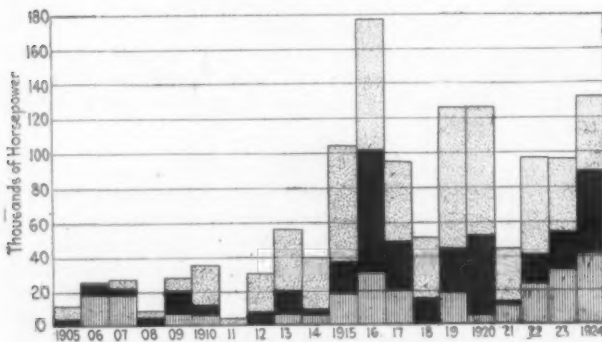
The cure in this case lay wholly in making cleaner, better steel. No changes were made in the sizes or shapes of the ingots or casting methods. Incidentally the same improved methods were applied thereafter to all other low-carbon steels with good results.

(To be concluded)

ELECTRIC MILL OPERATION

Concentration of Installations in 1915 to 1920—Many Motors Installed in 1924

SUPPLEMENTING the information covered at page 488 of the Feb. 12 issue of THE IRON AGE, further analysis of the figures tabulated by *Iron and Steel Engineer*, Pittsburgh, shows among other things that



Growth in the Application of Electric Drive to Main Rolls Is Shown Clearly Above. The great development of the war period is noteworthy. Dotted portions cover motors of 300 to 1999 hp.; solid black, those of 2000 to 4999 hp.; shaded with vertical lines, those of 5000 hp. and over. It will be noted that these big units entered the field early

some of the largest units were installed in the early days of electric drive. In fact, of the 24 units listed as

Table I—Data of Installation

Year	No.	Total Hp.	Average Hp.
1905.....	7	11,900	1,700
1906.....	9	25,640	2,849
1907.....	9	26,600	2,956
1908.....	8	8,050	1,006
1909.....	22	27,850	1,266
1910.....	35	34,400	983
1911.....	7	3,100	443
1912.....	27	30,100	1,115
1913.....	55	55,250	1,005
1914.....	43	39,475	918
1915.....	101	104,340	1,033
1916.....	118	177,460	1,504
1917.....	80	94,175	1,177
1918.....	50	50,000	1,000
1919.....	118	125,550	1,064
1920.....	129	125,820	975
1921.....	46	43,300	941
1922.....	84	96,405	1,148
1923.....	76	95,550	1,257
1924.....	71	131,400	1,851
Not stated	13	5,950	458
Total... 1,108		1,312,315	1,184

Table II—Large Motors Operating Rolling Mills

	5000 Hp. and Up		2000 to 5000 Hp.	
	No.	Hp.	No.	Hp.
Blooming mills.....	13	83,000	13	39,900
Bar and billet mills.....	11	63,000	18	50,850
Rail and structural mills...	9	53,000	19	53,900
Plate mills .....	7	40,500	17	48,800
Sheet bar and skelp mills...	2	11,500	18	48,550
Strip and hoop mills.....	1	5,500	13	31,520
Sheet and tin plate mills...	..	.....	9	18,500
Rod mills .....	..	.....	7	18,300
Piercing mills.....	..	.....	1	2,500
Wheel mills .....	..	.....	1	2,000
Merchant mills .....	..	.....	14	41,400
Total .....	43	256,500	130	356,220
Average size .....		5,965		2,740
Percentage of total list..	3.9	19.6	11.7	27.1

sent units of 5000 hp. and upward. The black areas, immediately above the shaded areas, indicate units of 2000 hp. and upward, but under 5000. The dotted areas at the top cover the small units—those under 2000 hp. In some years only two of the groups were represented, while in 1911 there was only the one group consisting of the smaller units. In 1924 the large units rivalled the totals in 1916, although the smallest size fell considerably below the big war year.

In Table I will be found the number of units and total hp. for each year, beginning with the first installations recorded—those of 1905. The last column of this table, showing the average hp. of the units purchased, is illuminating. It will be noted from this that 1906 and 1907, each of which saw the purchase of three 6000-hp. units in a total of nine units altogether, showed the highest average rating of any of the years listed. Only in 1924, when again a large number of large units was installed, has the figure gone much above half that of the two years mentioned.

Naturally, the largest number of large units has gone into blooming mills, with bar and billet mills in second position and rail and structural mills third. The situation with regard to these various types of mills, in connection with all motors of 2000 hp. and upward, is covered in Table II. From this it will be seen that 43 motors of over 5000 hp. each accounted for nearly one-fifth the total power installed, while the 130 units of 2000 to 5000 hp. represented more than one-fourth the total power. Motors from 1000 to 2000 hp. (not shown in the table) numbered 264, of 360,930 hp., or 27.5 per cent of the total; while motors of under 1000 hp., down to 300 hp., numbered 671 and had an aggregate of 338,665 hp., or 25.8 per cent of all.



## Proper Sand Control Reduces Losses

(Continued from page 1841)

there should be little or no pan material (through 270-mesh riddle.) It is true that uniformity of grain does promote permeability, but it does so at a sacrifice in bond and in texture that determines smoothness of surface. I do not believe it practical to maintain any considerable degree of uniformity in grain size, especially when cores are used. We have successfully varied the permeability in our molding heaps by controlling the clay content and the average grain size.

Good working qualities in a sand are not assured by proper grain size and proper quantity and quality of clay content alone. The clay substances must be properly distributed upon the surface of the grains. Mere mechanical mixing usually fails to accomplish this; a rubbing or mulling action, under feet of the molder or under the stroking or beating action of his shovel, or better still in a sand mixer of the muller type, is necessary to wrap the bonding material properly around the grains.

In dealing with sand producers the question has frequently arisen as to whether we can expect the producer to deliver sand to us with the bonding material properly wrapped about the grain. In some pits we find the sand naturally bonded in good shape; in other pits the clay and the grain are obtained largely from separate strata and mixed by hand or by machinery. When a sand from one of these latter pits comes to us it appears to be low in strength, and yet it may have the proper grain size and the proper clay content for a good sand. The bond test and permeability tests alone would mislead us regarding a sand's value because they measure the strength actually present—the sensible bond. The screen test, measurement of clay content and of colloidal content by dye adsorption, indicates a high potential bond, and by mulling this sample a few minutes we are able to bring out this value.

If we use as a facing sand as it comes from the producer then we should be careful to see that the bond is properly distributed upon the grains, but where we are introducing it into our molding heaps in small percentages to renew the life of the old sand, I do not believe this is necessary. In such a case we are interested in the potential bond alone.

### Sand Purchase and Control

These are, in general, the ideas which we are using in our control and reclamation work at the Ohio Brass Co. Sands are purchased according to grain size, clay content, durability and dye adsorption value, with due regard also to uniformity in their production. We do not check carload consignments as received, for bond or permeability. We carry in stock a No. 1 content, 6 to 9 per cent. This clay is not a particularly sticky clay as the dye adsorption value is only about 200. For bonding purposes a Gallia sand of about 30 per cent clay is used. This sand has a grain size averaging about 120 mesh; finer would be better. Its clay is very sticky, the dye adsorption value is about 1700. These sands are used only to rebond and condition refuse sand from our molding floors, about 60 per cent of the additions consisting of this refuse sand, more when the heaps get tight.

The refuse sand which we have been reclaiming consists of the fine material from foundry floor sweepings. The cores, core wires, scrap brass and spillings are hand picked and screened out with aid of a 12-mesh screen. This fine material, of which about 260 lb. is produced each week by each floor, has a bond value of about 125 (A. F. A. standard test), a figure too low for molding purposes in the type of work we are doing. It has an average grain size of about 120 and is more open than our molding heaps, due to the core sand which it contains. Its clay content is low and of poor quality.

For molding purposes we aim to hold our sand heaps at a bond value of 150 to 180 and permeability 18 to 25, depending on the type of work being made on each particular floor. To obtain these values we maintain an average fineness of grain of about 150 mesh

and a clay content of 7 to 9 per cent. Fineness tests are made on each heap at intervals of two or three weeks, to maintain proper grain size and to see that the clay content is proper. Bond and permeability tests are made daily, and additions are determined by the results of these tests. Low bond is remedied by addition of the Gallia red sand, low permeability calls for increased refuse sand, while high permeability indicates too coarse a grain and is offset by addition of No. 1 sand. If tests show sufficient clay and yet a low bond value, we urge the molder to cut his sand better so as to distribute the bond properly on the grain, and if immediate results are demanded we put the heap through a Simpson muller.

The sands mentioned above are not added directly to the heap. Additions of raw Gallia red sand result in dirty and even washed castings. The mixture indicated by the test results is compounded and then muller for a period of about 10 min. before it is put into the heaps. The resulting product has a velvety feel and a bond strength ranging from 180 to 250, according to contents of mixture and time of mulling.

### Sand Temper Also a Factor

As another step in studying our brass foundry molding losses, a careful investigation of temper conditions was made. Temper is an important factor because it influences bond, permeability and gas content of the sand and also affects the fluidity of the molten metal. Samples from several floors were tested for bond and permeability at various moisture contents, and it was determined that best molding conditions could be obtained when the sand carried between 6 and 7 per cent moisture, a little less being preferable when bond conditions are good. A number of moisture determinations, made on one heap over a period of a week, ranged from 5 to 9 per cent. Ten floors showed practically the same variation. We then undertook to train our molders to keep their heaps in a more nearly correct condition by the following procedure:

The heaps were sampled each day and the moisture was determined immediately. The samples were taken by the molders themselves and they were asked to express their opinion of the temper. The tests were reported back to the molders and their instructors. At first these results meant nothing to them, but tact on the part of the assistant, who had had experience as a molder, soon aroused interest and they put forth an effort to keep the sand at right temper. A large share of the molders showed considerable improvement, a few showed little or none. We found that a great deal depended on the attitude of the molder, the stubborn know-it-all worker getting little benefit from tests. However, as these men are in the minority, the results in general have been good. A special apparatus for determining moisture rapidly was constructed which enabled us to carry on the work more efficiently, so far as time and effort was concerned. We now make the moisture tests at irregular intervals, so as to help the molder keep the temper of his sand within limits.

Another important factor in our foundry control work is the system for determining and recording losses. Each molder's castings are kept separate until they have been cut from the gates, cleaned and inspected. Molding losses due to dirt and shifts are charged against the molder's piece-rate wage. The instructors may earn a weekly bonus by making low losses. The daily loss of each molder is reported back to the instructor and charts showing the loss of the group under each instructor are posted. The losses on each molding floor are coordinated with the physical characteristics of the heaps and the additions of sand, as an aid to the man handling the sand.

### Reduction in Both Cost and Losses

The results of a year and a half of control work have been so gratifying that the work is now being extended to our malleable iron foundry. The reclamation work alone has made no great saving, because the consumption of sand in our brass foundry is not large. It has, however, covered the expense involved in reclamation and control work, giving us at the same time the benefits in the way of reduced losses as clear gain.

During 1922 and 1923 the cost of new molding sand used in our brass foundry was slightly over \$1 for each ton of good castings produced. This was due to the fact that we were using only high-grade Eastern sands and paying high freight rates. During the past year (1924) this item has averaged only 46c. per ton of castings, a reduction of 54 per cent.

The reduction in foundry losses has been worth much more. It averaged 8.4 per cent for 1923. Since that period there has been a marked reduction, the average loss for 1924 having been 4.2 per cent. Dirty castings were reduced 60 per cent and blows and misruns 55 per cent. This reduction in losses is, of course,

not due to molding sand alone. We would certainly not ascribe it to the use of recovered refuse. The personal factor is such an important element in molding that due credit must be given to the molders, their instructors and foremen. There is no doubt, however, but that the sand control work has been a most important factor in two respects.

First, it has helped to keep the sand heaps in good condition and so permits the molder to get better results; second, it is giving definite knowledge about the condition of the sand, so that no longer is the sand "the goat" for every trouble the molder may have, the cause of which is not readily apparent.

## COMMUNITY BUILDING

### Industries of America Should Assume Civic Responsibility, Says Bennett Chapple

IF the industries of America would arouse themselves to civic responsibility in building up the larger community life which exists outside of factory walls, greater prosperity and contentment would blossom and bear fruit in every section of the country, said Bennett Chapple, director of publicity, American Rolling Mill Co., Middletown, Ohio, in an address before a group of industrial advertisers. Mr. Chapple's subject was, "The Industrial Advertiser as a Molder of Community Development."

Mr. Chapple told what had been done in Middletown in community building. "Four years ago, shortly after the close of the World War," he said, "the citizens and industries of Middletown decided to help win the problems of peace by utilizing the machinery which they had built up to put across the 'Win the War' campaigns."

"A broad program was laid down in which were listed the civic needs of this city of 25,000 people so that its residents might better enjoy life, liberty and the pursuit of happiness. This program included 17 different civic agencies, among them such familiar ones as an enlarged hospital, library, Y. M. C. A., Girl Scouts, Boy Scouts, home nursing and recreation—all coordinated under an administrative staff headed by a managing director.

"To put these organizations on a proper basis required \$1,000,000—a staggering amount for 25,000 people to raise. Yet by hard effort and much courage, the citizens and industries of Middletown together, in a campaign lasting three weeks, succeeded in raising \$1,056,000 as a free-will offering to launch their program. Then having built the necessary buildings, an additional maintenance fund of \$175,000 a year was provided to carry on the work.

"To provide this maintenance fund and to insure a proper administration of it, the Middletown Civic Association was organized with membership dues of \$12 a year or multiples thereof. More than 4200 people in Middletown are today members of this association, subscribing at least \$12 a year, or multiple memberships if they can afford it. The industries on their part have subscribed to memberships equalling the same amount of money subscribed by the citizens. In other words, the industries are carrying 50 per cent of the cost of the program as their contribution to the community. For instance, the American Rolling Mill Co. is a large contributor to the Middletown Civic Association in effort, interest and money. Nor would I have you believe that the American Rolling Mill Co. stands alone in this work. There are 40 separate industries in Middletown, big and little, each bearing its proportionate cost. The point is, there are no 'blind baggage' riders among the industries of Middletown and they frankly and fairly share their civic responsibility. It is a true fifty-fifty proposition."

Mr. Chapple said that such work for the community by industries is not altruism, but plain business. "Enough has been done," he said, "to prove beyond doubt that such an interest on the part of industries outside their factory walls pays dividends in stabilizing labor conditions in the community. If this is true, it follows that such communities, if enjoying contented,

prosperous conditions, become better markets for the products of other industries."

## POLISH IRON AND STEEL

### Production in 1924 Far Below Pre-War—Early 1925 Figures No Better

WARSAW, POLAND, June 7.—In 1924, on the average, 21 blast furnaces were operated in Polish Silesia, and 12 in the Kielce district; 37 Martin (open-hearth) furnaces in Silesia, 27 in Kielce, and 2 in the Cracow district; 5 Thomas furnaces, all in Silesia, and 7 electric furnaces, of which 6 were in Silesia. Complete production, as compared with 1923 and the last pre-war year, was (in metric tons):

Pig Iron			
District	1913	1923	1924
Silesia .....	613,218	408,572	263,208
Kielce .....	417,905	107,340	67,695
Total .....	1,031,123	515,912	330,903
Steel Ingots and Castings			
District	1913	1923	1924
Silesia .....	1,033,997	860,683	522,611
Kielce .....	602,876	252,257	157,636
Cracow .....	11,660	9,681	2,063
Total .....	1,648,533	1,122,621	682,310
Rolled Products			
District	1913	1923	1924
Silesia .....	719,807	590,480	365,355
Kielce .....	436,834	167,482	104,651
Cracow .....	7,389	9,748	2,095
Total .....	1,164,030	767,710	472,101

Of the total 1924 rolled goods production, 122,353 tons were sheets; of the total steel production, 598,688 tons were by Martin (open-hearth) process.

For 1925 only the Polish-Silesia figures for the first two months are available. Pig iron production in January was 19,488 tons; February, 10,063 tons; steel, 43,107 and 45,017 tons, respectively; semi-finished materials, 4818 and 3661 tons, respectively; and rolled goods, 35,106 and 37,233 tons, respectively.

### Record Building Construction Continues

May construction of buildings in the United States, at \$496,024,000, was the greatest total, with the exception of April, which has ever been recorded in any one month, according to F. W. Dodge Corporation. The April figure was \$546,971,000. Almost half of the May total, or 231,182,000, was residential buildings. Commercial buildings accounted for \$80,280,000, while industrial plants provided only \$27,562,000, or 5.6 per cent of the total.

Construction started during the first five months of the year has amounted to \$2,119,564,000, an increase of nearly 10 per cent over the corresponding period of last year, and a new high record. Without exception, every district of the country recorded a substantial increase in May over May, 1924. These range from 3 per cent in the New York district to 46 per cent in the Central West. Similarly, most of the districts reported a heavy gain in the five months of 1925 over the corresponding period of 1924. The New York district, however, showed a drop of 24 per cent, construction this year in the five months having amounted to \$503,060,000. In the Pittsburgh district the increase for the five months reached 55 per cent.



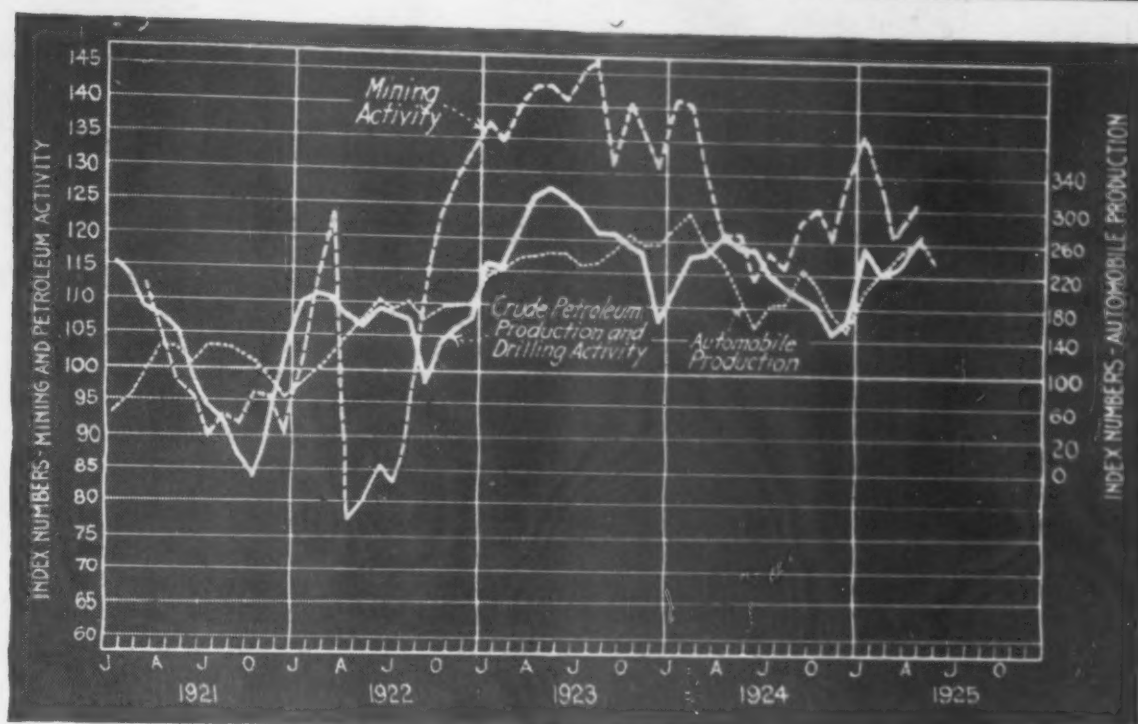


Fig. 4—Consuming Industries Still Very Active, Automobile Production Off Slightly

### Business Looks for Fall Recovery

(Concluded from page 1845)

barometer often leads scrap prices by a month or two.

#### Large consumption of steel indicated

THREE large steel consuming industries showed a good level of activity in April and May. The high level of the automobile, mining and petroleum curves shown in Fig. 4 confirms reports of sustained consumption of iron and steel. On the whole they are a little higher than they were a year ago.

Automobile manufacturers, according to all reports, are following a conservative policy. Though a seasonal decline in the industry is at hand, no large setback is indicated. In fact, the reduction of 4 per cent of automobile output in May has a favorable development and insures against the over-production of other years.

The petroleum industry is in rather a favorable position with a strong gasoline situation and declining crude oil production.

The small upturn in mining production in April will probably be followed by a decline in May, but the outlook is better than it was a year ago.

#### Money rates and building activity favorable

IT has become almost a matter of habit to say "money continues easy." The fact is none the less significant. Allowing for seasonal variation, the average rate on the best commercial paper declined in May and averaged only 3.8 per cent. The June average will be still lower. Call loan rates in New York are running around 3%—4 per cent.

With industry and business activity declining slightly, the price level down from the beginning of the year, and ample supplies of money and credit, there is no pros-

pect of anything but continued ease in the money markets during the summer.

Though the trend of building activity is gradually downward, all indications are that the total for 1925 will be but little under the large figure for 1924.

In May the total floor space in contracts awarded, as reported by the F. W. Dodge Corporation, decreased from 82.5 million sq. ft. to 78.9 million in spite of the fact that there is usually a small gain in May. Accordingly the adjusted index fell to 179.6 per cent of the 1921 average, against 189.5 per cent in April.

Contemplated new construction also declined in May more than usual for the season. The figure was considerably larger than that of a year ago, but the trend was down.

The unfilled orders for bath tubs, sinks, and similar enameled ware have decreased steadily since February and are not much more than a third as large as they were at this time in 1924.

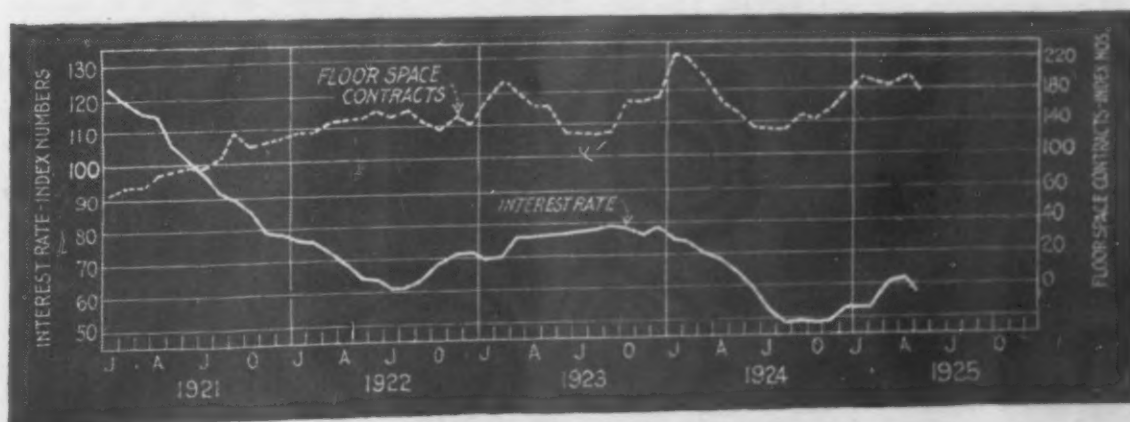


Fig. 5—Money Still Continues Easy and Will Probably Be So All Summer

# Machinery Markets and News of the Works

## ACTIVITY AT CHICAGO

### Detroit Automobile District Shows Fair Demand for Machine Tools

### Santa Fe Railroad Is Buying—New List Expected from Illinois Central—Industrial Buying Better in Spots

ALTHOUGH machine tool business cannot be described as brisk, there is a better demand in some sections, notably in the Detroit automobile district, while at Chicago railroad buying and inquiry constitute the chief feature of the market, but orders from industrial companies are more numerous.

The Santa Fe Railroad continues to buy against

its extensive inquiries and a complete distribution of orders is expected within the next week or two. The Illinois Central has completed its large purchases, but will issue a new list soon for its Paducah, Ky., shops. The Chicago, Milwaukee & St. Paul is buying in a small way, but no definite word has come out as to when the Burlington will take action on its pending requirements.

The automobile industry is an important factor in current buying, both in the Detroit district and in the Chicago district. The Nash Motors Co. has closed for additional equipment for its Kenosha and Milwaukee plants, and there is fair general buying in Detroit.

Perhaps the dullest spot in the country is New England, though none of the Eastern section of the country is as active as the Middle West.

## New York

NEW YORK, June 23.

IN some machine tool selling offices the business done thus far in June is better than that of May. There are no striking developments, however, and the trade does not look for pronounced change in the situation before early autumn. Bids have gone in to the Navy Department on a 35-ft. boring and turning mill for the Washington Navy Yard, the bids ranging upward of \$70,000. The Florida East Coast Railway has bought a 6-ft. radial drill. The General Electric Co. ordered an engine lathe, 48 in. x 42 ft., and the Heppenstall Forge Co., Pittsburgh, bought a billet descaling machine.

The Keystone Equipment Co., Arcade Building, 1947 Broadway, New York, has inquiries out for two locomotive cranes, 15 to 25 tons capacity each; a crawler type traction shovel, with 2-yd. capacity dipper; a number of standard gage, steel frame dump cars; and several steel horizontal storage tanks, from 6000 to 30,000 gal. capacity each.

The Nassau Consumers' Ice Co., 874 Dean Street, Brooklyn, will build a one-story ice-manufacturing plant, 120 x 200 ft., at East Rockaway, N. Y., to cost approximately \$250,000 with machinery. Bly & Hamann, 551 Nostrand Avenue, Brooklyn, are architects. A. D. Smith is president.

Bids will be received by the New York Central Railroad Co., W. C. Bower, manager of purchases and stores, room 344, 466 Lexington Avenue, New York, until July 8 for electric locomotives, serial contract No. 16-1925; until July 2 for wire nails and staples, seamless steel tubes, car and tender truck axles, steel shapes and steel bars, serial contract No. 18-1925.

Ricca & Ungarleider, 186 Remsen Street, Brooklyn, architects, have plans for a one-story and basement automobile service, repair and garage building, 91 x 300 ft., to cost \$80,000.

The Pan-American Petroleum Co., 120 Broadway, New York, is said to be arranging an appropriation of \$1,500,000 for extensions and improvements in its oil refineries, storage and distributing plants, and the installation of equipment. It is expected to build new distributing and storage works in different parts of the country.

Emery Roth, 119 West Fortieth Street, New York, architect, has awarded a general contract to the Turner Construction Co. for a six-story automobile service, repair and garage building on 102d Street, estimated to cost \$1,250,000 with equipment.

Bids are being asked by the Cassidy Co., 101 Park Avenue, New York, manufacturer of electric-lighting fixtures,

for its proposed new plant at Long Island City, estimated to cost \$100,000 with equipment. C. F. and D. C. Mulvey, and Leonard Smith, 3 Bridge Plaza, Long Island City, are engineers.

The Packard Motor Car Co., Broadway and Sixty-first Street, New York, has filed plans for a two-story service, repair and headquarters, 204 x 270 ft., to cost \$400,000 with equipment. Albert Kahn, Inc., Marquette Building, Detroit, is architect.

The Todd Shipyards Corporation, 25 Broadway, New York, is consolidating its subsidiaries, the Todd Oil Burner Engineering Corporation and Tebo Yacht Basin Co., plants at the works of the last noted company, foot of Twenty-fourth Street, Brooklyn, and will manufacture fuel oil burner equipment at this location in the future. It will also close the plant of the Todd Dry Dock & Construction Co., at Tacoma, Wash. William H. Todd is president.

Rotholz & Stillman, 311 Lenox Avenue, New York, architects, have completed plans for a six-story automobile service, repair and garage building at 239-43 East Ninety-fourth Street, 75 x 100 ft., to cost approximately \$250,000 with equipment.

The Lake Island Refining Corporation, 25 West Forty-third Street, New York, will take bids early in July for a new plant near Tottenville, S. I., for the manufacture of industrial alcohol and kindred products, to cost more than \$500,000 with equipment. Ophuls & Hill, 112 West Forty-second Street, New York, are engineers.

Fire, June 13, destroyed a section of the plant of A. P. Munning & Co., Church Street, Matawan, N. J., manufacturer of electroplating appliances, buffing equipment, etc., with loss reported at \$50,000. It is planned to rebuild.

The West Milford Electric Co., West Milford, N. J., contemplates the construction of a steam-operated electric generating plant in Passaic County, with extension of transmission lines. Application has been made for permission to issue stock to carry out the work.

Fire, June 17, destroyed a portion of the lumber plant of the Consumers' Coal & Ice Co., Fiftieth Street and Avenue E, Bayonne, N. J., with loss of about \$200,000 including equipment and stock. The plant of the Bayonne Plumbing Supply Co., on adjoining site, was also partially destroyed, with loss of \$50,000. Both companies have plans for rebuilding under consideration.

The Public Service Railway Co., Terminal Building, Newark, N. J., has plans for a one-story machine shop at 222 Bloomfield Avenue, to cost about \$150,000 with equipment.

Electric power equipment, hoisting and conveying machinery will be installed in the eight-story storage and distributing plant to be erected by the National Grocery Co., 480 Montgomery Street, Jersey City, N. J., for which con-



tracts for excavations have just been awarded to the Stillman-Delehanty-Ferris Co., 1 Exchange Place, estimated to cost \$500,000.

P. J. Jossier, 242 Broad Avenue, Palisade Park, N. J., architect, has preliminary plans under way for a two-story automobile service, repair and garage building, 50 x 100 ft., at Englewood, N. J., to cost \$45,000 with equipment.

## Philadelphia

PHILADELPHIA, June 22.

**T**HE Philadelphia Rapid Transit Co., 810 Dauphin Street, Philadelphia, has awarded a general contract to H. E. Baton, Inc., 1713 Sansom Street, for additions in its car house and shops, including improvements in the present structure, at Forty-first and Holly Streets.

A. Shotz & Co., 1324 Walnut Street, Philadelphia, have plans for a one-story automobile service, repair and garage building, 112 x 245 ft., to cost \$140,000 with equipment.

The Armstrong Cork Co., foot of Jefferson Street, Camden, N. J., manufacturer of insulating board and kindred products, has plans for a four-story and basement addition, 72 x 75 ft., to cost \$75,000 including equipment. Headquarters of the company are on Twenty-fourth Street, Pittsburgh.

The Ajax Rubber Co., Inc., Breunig Avenue, Trenton, N. J., manufacturer of automobile tires, etc., has filed plans for a one-story addition estimated to cost \$23,000.

The Freeman Electric Co., 803 East Street, Trenton, N. J., manufacturer of electrical equipment, has awarded a general contract to William C. Ehret, 13 West State Street, for a new plant to cost \$50,000 with equipment.

The Department of Institutions and Agencies, State Office Building, Trenton, N. J., will soon take bids for the installation of a cold storage plant at the State hospital, estimated to cost \$50,000. A. B. Mills, State Office Building, is architect.

The Board of Education, Audubon, N. J., plans the installation of manual training equipment in its proposed new high school, to cost about \$200,000, for which bids are being asked on a general contract until June 29. Arnold H. Moses, 119 South Fourth Street, Philadelphia, is architect.

The Hastings Battery Service & Sales Co., 600 Wyoming Avenue, Scranton, Pa., has awarded a general contract to S. Sykes & Sons, 1229 Penn Avenue, for a new service and repair building, 40 x 120 ft., to cost \$45,000 with equipment. Herman C. Rutherford, 316 North Washington Avenue, is architect.

The Harrisburg Light & Power Co., Harrisburg, Pa., has called a special meeting of stockholders on Aug. 17 to approve an increase in capital from \$3,300,000 to \$4,000,000, a portion of the proceeds to be used for extensions in power plant and system.

The Viscose Co., Marcus Hook, Pa., has awarded a general contract to Ray S. Shoemaker, 421 Walnut Street, Harrisburg, Pa., for a one-story machine shop and wood-working plant, 90 x 160 ft., at its artificial silk works at Lewistown, Pa., to cost about \$50,000 with equipment. The Ballinger Co., 105 South Twelfth Street, Philadelphia, is architect.

The Hershey Chocolate Co., Hershey, Pa., has tentative plans for additions in its cane sugar grinding mill at Central Hershey, Havana district, Cuba, to double the present capacity and estimated to cost \$1,000,000. It has acquired the sugar mill and properties, known as the Central San Antonio, at Madruga, Cuba, and plans extensions and betterments.

The Board of Education, York, Pa., is asking bids on a general contract until June 29, for the construction of its proposed two-story and basement industrial high school, 230 x 245 ft., to cost \$1,000,000 with equipment. John B. Hamme, City Bank Building, is architect. Henry Adams, Calvert Building, Baltimore, is mechanical engineer.

A Fisher, care of Henry L. Reinhold, Jr., 1513 Walnut Street, Philadelphia, architect, has plans under way for a one and one-half story machine and repair shop, at Huntingdon, Pa., to cost about \$18,000.

Bitler, Haines & Liddle, Inc., 203 Berks County Trust Building, Reading, Pa., has been organized to manufacture automotive products and service station equipment, specializing for the present in jacks. Manufacturing will be done by contract, the initial orders being placed. Mark H. Liddle is president and J. M. Bitler, secretary-treasurer.

The Kline Auto Body Co., Allentown, Pa., now being organized by Herman A. Kline, formerly head of the body building department of the Daniels Motor Car Co., Reading, Pa., and associates, will acquire a local plant for the manufacture of automobile bodies. Headquarters are at 328 South Seventeenth Street.

## South Atlantic States

BALTIMORE, June 22.

**F**IRE, June 16, destroyed the cooperage plant of the Kimball-Tyler Co., Inc., Eighth Avenue, Baltimore, with loss reported at \$250,000 including equipment. Plans for rebuilding are under consideration.

The Linthicum Stone Corporation, Baltimore, has been chartered under State laws with capital of \$1,000,000, and 700 shares of common stock, no par value, to take over the plant of the Stuart R. Carr Foundry Co., Boston Street and Montford Avenue, to be remodeled and equipped for the production of artificial stone specialties. Frank H. Linthicum is president and general manager.

Thomas Hampton, 109 Chevy Chase Drive, Washington, and associates have acquired about 1800 acres of coal properties in the Gunton Park district, Wytheville, Va., and are reported planning the installation of equipment, and the construction of a steel tippie.

The Norfolk & Western Railway Co., Clyde Cocke, room 351, N. & W. Railway Building, Norfolk, Va., is asking bids until July 1, for requirements from July 1 to Sept. 30, of steel fencing, steel springs, wrought steel pipe, couplers and parts.

Samuel D. Hewlett, Atlanta, Ga., and associates are considering plans for a five-story automobile service, repair and garage building estimated to cost \$250,000 with equipment.

The Hackley-Morrison Co., 1708 Lewis Street, Richmond, Va., machinery dealer, has inquiries out for a universal milling machine, six all-steel, standard gage dump cars, about 16-yd. capacity, and one 20-in. shaper.

The Lancaster County Board of Education, Lancaster, S. C., plans the installation of manual training equipment in the proposed consolidated high school to be erected at Midway, estimated to cost \$160,000, for which bids have been asked on a general contract.

The Charlotte Electric Repair Co., 508 West Fourth Street, Charlotte, N. C., has awarded a general contract to the A. J. Jones Construction Co., Charlotte, for a two-story plant, 55 x 120 ft., to cost about \$22,000 with equipment. W. H. Smith is president.

The Linde Air Products Co., 30 East Forty-second Street, New York, has tentative plans under consideration for the erection of new works at Roanoke, Va., estimated to cost \$225,000 with equipment.

The R. S. Armstrong & Brother Co., 676 Marietta Street, Atlanta, Ga., machinery dealer, has inquiries out for a double cylinder, 8 1/4 x 10-in., two or three drum hoisting engine.

The Crown Oil & Wax Co., 200 South Eighteenth Street, Baltimore, is said to be considering the erection of a two-story service and distributing works to cost close to \$100,000 with equipment.

The Board of Education, Hagerstown, Md., plans the installation of manual training equipment in its proposed three-story high school to cost \$300,000, for which superstructure work will soon begin. A. J. Klinkhart, 53 West Washington Street, is architect.

The North Georgia Marble Products Co., Whitestone, Ga., is considering the installation of a roll mill, duplex ring type, second-hand equipment will be purchased.

The Glascock Stove & Mfg. Co., Greensboro, N. C., has awarded contract to the Carolina Steel & Iron Co., Greensboro, for a one-story foundry, 80 x 160 ft.; one-story cleaning and nickel-plating department, 32 x 80 ft., and two-story pattern department and storage building, estimated to cost \$45,000. T. A. Glascock is president.

The Empire Machinery & Supply Corporation, 409 East Water Street, Norfolk, Va., is considering rebuilding the portion of its works recently destroyed by fire with loss approximating \$30,000. It has been occupying a leased building.

The Carolina Canning Co., Aberdeen, S. C., has inquiries out for shafting, pulleys and other transmission equipment.

The Board of Education, Rutherfordton, N. C., is asking bids until June 30 for a 75,000 gal. steel tank on 75-ft. steel tower. The Carolina Engineering Co., Johnston Building, Charlotte, N. C., is engineer.

The Tarboro Building Supply Co., Inc., Tarboro, N. C., has inquiries out for a heavy duty, belt-driven sand pump, about 6 or 8 in.

The Board of Education, Appalachia, Va., is considering the installation of manual training equipment in its proposed new high school, estimated to cost \$135,000, for which superstructure will soon begin. Clarence B. Kearfoot, Bristol, Va., is architect.

The Warren Co., 775 East Fair Street, Atlanta, Ga., glass products, has acquired about 12 acres adjoining its works and plans the early erection of several additions, including

## The Crane Market

FEW new inquiries have appeared in the past week for either locomotive or electric overhead cranes. Several sizable purchases of overhead equipment are expected to be made shortly. According to reports from the Chicago district, Joseph E. Nelson & Son, contractors on the new shops of the Chesapeake & Ohio Railroad, are awarding the cranes and other material handling equipment on the list issued some time ago by the railroad. The Baldwin Locomotive Works is reported to be acting as purchaser for a foreign railroad intending to build shops, and Joseph T. Ryerson & Son, Jersey City, N. J., have been inquiring for cranes for this purpose. The Fitzgibbons Boiler Co., 47 West Forty-second Street, New York, is in the market for two 15-ton electric traveling cranes. The Pennsylvania Railroad is securing prices on a 3-ton electric hoist.

Among recent purchases are:

Chesapeake & Ohio Railroad, a 300-ton locomotive hoist

and two 50-ton drop tables from the Whiting Corporation, and 28 1-ton chain blocks, reported to have been placed with the Chisholm & Moore Mfg. Co.

Georgia, Florida & Alabama Railway Co., a standard ditcher from the American Hoist & Derrick Co.

Habirshaw Electric Cable Co., Yonkers, N. Y., a 6-ton, 34-ft. span electric traveling crane, reported purchased from the Northern Engineering Works.

Simon Scullin Foundry Co., Philadelphia, a 1-ton, 48-ft. span hand power crane from Alfred Box & Co.

Heintz Mfg. Co., Philadelphia, a 10-ton, 19-ft. span, 2-motor overhead crane from Alfred Box & Co.

City of Spartansburg, S. C., a 7½-ton, 37-ft. span hand power crane from Alfred Box & Co.

Pennsylvania Railroad, a 15-ton, 98-ft. span crane from the Niles-Bement-Pond Co.

a main four-story structure. Additional machinery will be installed in the mirror and beveling department, and an electrically operated traveling crane will be installed in a proposed glass distributing building. Lockwood, Greene & Co., Healey Building, is architect and engineer. V. P. Warren is president.

The Common Council, Leesville, S. C., is considering the installation of pumping machinery in connection with proposed extensions and improvements in the municipal water-works estimated to cost \$40,000. The Carolina Engineering Co., Charlotte, N. C., is engineer.

The Baltimore Tool Works, Inc., 1109 American Building, Baltimore, recently organized with \$25,000 capital stock, is equipped to manufacture a complete line of forged tools, as well as for heat treatment and hardening of dies, special parts, etc.

## Detroit

DETROIT, June 22.

PLANS are under way for an addition to the factory of the Sparks-Withington Co., Jackson, Mich., manufacturer of automobile appliances, to cost \$45,000 with equipment.

The Board of Education, Milford, Mich., plans the installation of manual training equipment in its proposed two-story high school to cost \$160,000. J. N. Churchill, Prudden Building, Lansing, Mich., is architect.

Fire, June 13, destroyed a portion of the lumber and wood-working plant of the Kneeland-Bigelow Co., Bay City, Mich., with loss estimated at \$175,000 including equipment. It is planned to rebuild.

The Gray Motor Corporation, Detroit, has secured the manufacturing rights for the Tilling-Stevens gas-electric bus, and will devote a portion of its plant to this line of production. Additional tools to cost about \$15,000 will be installed. It is arranging a financing program to provide available cash of \$1,000,000 for expansion and operations. Ernest M. Howe has recently been elected president, and Henry W. Burritt, vice-president and treasurer.

Superstructure will soon begin for the proposed addition to the plant of the Fenton Machine Tool & Die Co., Fenton, Mich., one-story, saw-tooth roof type, 120 x 160 ft. A general contract was recently awarded to the H. K. Ferguson Co., 4900 Euclid Avenue, Cleveland.

The Lindell Drop Forge Co., Lansing, Mich., has completed plans for a one-story addition to cost about \$35,000.

The Ampco Twist Drill & Tool Co., Detroit, is said to be arranging for the removal of its plant to Jackson, Mich., where increased facilities will be provided for larger production.

The Hudson Motor Car Co., 12601 East Jefferson Avenue, Detroit, has asked bids on a general contract for a one-story addition, 65 x 480 ft., to cost about \$75,000. It will be used for assembling. Albert Kahn, Marquette Building, is architect.

The American Vitrified Products Co., Grand Ledge, Mich., manufacturer of sewer pipe, tile and kindred products, will rebuild its plant destroyed by fire several months ago, comprising a four-story structure, to cost \$100,000 with equipment. F. C. Carnahan is general manager.

Hugh T. Millar, Lightner Building, Mount Clemens, Mich., has revised plans for a one-story automobile service, repair and garage building, 100 x 240 ft., to cost \$75,000.

The Signal-Lite Co., Chicago, manufacturer of radiator caps and other automobile appliances, is arranging for the

removal of its plant to Benton Harbor, Mich., where increased facilities will be provided.

The Ford Motor Co., Detroit, is asking bids on a general contract for a one-story addition at its Dearborn plant, 201 x 315 ft., to be used as a nickel-plating works, forge and blacksmith shop, and other kindred service. Albert Kahn, Marquette Building, Detroit, is architect.

The Harper Automatic Supply Co., 406 Lafayette Building, Detroit, recently organized to manufacture vending machines, will conduct operations for the present under contract. It has made arrangements for a small initial order. W. J. Harper is president and general manager.

The W. H. Anderson Tool & Supply Co., 2178 Franklin Street, Detroit, is in the market for a used 12-ft. power brake for handling 10-gage material or heavier.

The Fox Engineering Co., 1435 Franklin Street, Detroit, has been organized to do a general line of jobbing machine work. It will also manufacture speedometers. It has established a shop and will add equipment as needed. O. P. Bernhart is president.

## Buffalo

BUFFALO, June 22.

THE Northern New York Utilities, Inc., Watertown, N. Y., has plans for an automatic hydroelectric generating station on the Beaver River, near Taylorville, N. Y., with initial capacity of 21,000 hp. A transmission line will be constructed. The entire project will cost \$250,000.

The Board of Public Utilities, Jamestown, N. Y., Melvin O. Swanson, superintendent, is asking bids until June 30 for the construction of an addition to the municipal electric light and power plant on Steele Street. Louis T. Klauder, Bankers' Trust Building, Philadelphia, is engineer.

Lewis & Hill, 892 Main Street, Buffalo, architects, are taking bids for a two-story automobile service, repair and garage building, 80 x 120 ft., at Lockport, N. Y., to cost \$40,000 with equipment.

Bids are being asked by the Board of Education, 900 Genesee Building, Buffalo, until July 16, for the construction of an East Side high school at Fougerson Street and East Parade Avenue, to include a manual training department, estimated to cost \$450,000. F. J. and W. A. Kidd, 424 Franklin Street, are architects.

The St. Lawrence Valley Power Corporation, Potsdam, N. Y., has plans for a hydroelectric power house, automatic type, near Potsdam, with initial capacity of 64,999 hp., to cost more than \$175,000 with transmission line.

The City Council, Buffalo, has authorized plans and specifications, with call for bids for the construction of a new steel water tower and tank in the North Buffalo section, for the municipal waterworks.

The Board of Lighting Commissioners, Gouverneur, N. Y., is asking bids until July 9 for the construction of a municipal power dam and hydroelectric power plant with equipment. Lewis C. Reynolds, Geneva, N. Y., is engineer.

Plans are being prepared by the Three Rivers Glass Mfg. Co., San Antonio, Tex., for the installation of a light and power plant, for public service, at Three Rivers, Tex. The initial unit will be 150 hp.

Special machinery and equipment, for the manufacture of electric heaters will be installed by Charles Sparling, 53 Congress Street, Buffalo, in connection with a proposed plant.

The Kingan Provision Co., Fulton Street, Syracuse, N. Y., is in the market for mechanical refrigeration and cool-



ing machinery, as well as transmission, conveying and hoisting equipment for a \$100,000 plant under construction.

M. Moran & Son, 10-12 Bennett Street, Buffalo, operating an automobile sales and service, are in the market for a cylinder reboring machine, lathe, and other tools for a new garage, replacing one destroyed by fire.

## Pittsburgh

PITTSBURGH, June 22.

CONTRACT has been awarded by the Monongahela Railroad Co., Brownsville, Pa., to the H. K. Ferguson Co., for a one-story car repair and machine shop, 250 x 250 ft., estimated to cost \$100,000 with equipment.

The Board of Education, Herminie, Pa., is considering the installation of manual training equipment in its proposed two-story high school, estimated to cost \$110,000, for which it is expected to ask bids soon on a general contract. C. C. Compton, Fourth and Thompson Avenues, Donora, Pa., is architect.

The Baldwin Tool Works, Inc., Parkersburg, W. Va., has awarded a general contract to the Plate Construction Co., 726 Jeannette Street, for a one-story addition, to cost \$75,000 with machinery.

Manual training equipment will be installed in the proposed high school to be constructed by the Martinsburg Independent School District, Martinsburg, W. Va., estimated to cost \$310,000, in which amount bonds have been voted. It is expected to select an architect to prepare plans at an early date.

The City Council, Ronceverte, W. Va., is asking bids until June 29 for equipment for waterworks extensions and improvements, including two raw water centrifugal pumps, each with capacity of 350 gal. per min., direct-connected to electric motors; filter plant, with electric pump room, and accessory equipment. H. K. Bell, Hernando Building, Lexington, Ky., is engineer. A. S. Woodhouse is city clerk.

The Parkersburg Iron & Steel Co., Beechwood Street, Parkersburg, W. Va., has acquired about 12 acres as a site for a new plant to manufacture sheet iron and metal products, including pipe bends, etc. The initial works are estimated to cost \$65,000.

The Board of Education, Mannington, W. Va., is considering the installation of manual training equipment in its proposed high school to cost \$150,000, for which bids are being received on a general contract until June 29. S. W. Ford, Latsetter Building, Clarksburg, W. Va., is architect.

The Combination Stamping Co., 616 Columbus Boulevard, Charleston, W. Va., is considering the establishment of a new plant for the manufacture of a patented shade hanger and other stamped metal products. M. J. Simms is president.

The Penn Metal Co., 675 Concord Avenue, Cambridge, Mass., is reported to be contemplating the establishment of a new plant in the vicinity of Parkersburg, W. Va., for the manufacture of metal goods.

## Cleveland

CLEVELAND, June 22.

MACHINE tool business improved in this territory the past week. Local dealers booked a fair volume of orders for single machines and for lots of two or three and report more inquiries than for several weeks. There is still a fair demand from Detroit automobile companies. Turret lathes continue to move well. A local manufacturer took an order during the week from the Hammond Brass Co., Hammond, Ind., for 10 or 12 brass working lathes and in addition booked a number of single machines. The Cleveland Planer Co. reports that demand for planers is more active than it has been for a long time. This company recently closed for two 48-in. planers for the Ramapo-Ajax Co., Hilborn, N. Y., a 26-in. planer for the Boston Elevated Railway, 48-in. planer for the Pittsburgh Plate Glass Co., 26-in. planer for the Collinwood high school, Cleveland, and a 48-in. machine for the Dominion Sugar Co., Cuba.

The Dust Recovery & Conveyor Co., 2130 St. Clair Avenue, Cleveland, manufacturer of dust-arresting equipment, will build a new plant, 90 x 180 ft., at East 116th Street and Harvard Avenue. The general contract has been placed with the H. K. Ferguson Co.

The Industrial Fibre Corporation, Cleveland, will erect several factory buildings at West Ninety-eighth Street and

Walford Avenue. W. S. Ferguson, 100 Euclid Building, is the consulting engineer.

The Ferro Enameling Co., 4150 East Fifty-sixth Street, Cleveland, has awarded a contract to the Phillips Kirschner Co., 2914 East Seventy-first Street, for a two story addition, 23 x 54 ft., to its annealing building. C. M. Horn, 2100 Keith Building, is secretary.

The France Mfg. Co., 10325 Berea Road, Cleveland, has awarded contract to the Superbuilt Construction Co., 1836 Euclid Avenue, for a one-story factory, 50 x 62 feet.

The Superior Bronze & Aluminum Co., Warren, Ohio, is building a plant, 40 x 120 ft., for the manufacture of brass and aluminum castings. Arthur J. Gilmore is general manager.

## Cincinnati

CINCINNATI, June 22.

A FAIRLY good volume of business has been booked by machine tool builders in this district the past week, including sales to Detroit automobile manufacturers as well as to railroads. Orders from the general industrial field are coming from all parts of the country. Some machine tool manufacturers are of the opinion that June will be the biggest month of the year in both production and sales. Export business has fallen off lately because builders are unable to meet prices of European sellers. One plant in this territory booked an order for a 42-in. carwheel lathe for shipment to Japan.

The General Electric Co., Schenectady, N. Y., placed an order for a 48-in. lathe, and the Marion Steam Shovel Co., Marion, Ohio, has ordered an 18-ft. boring mill. Sale of a 6-ft. boring mill to Texas is reported by one company. The Cincinnati Planer Co. has sold a 72-in. planer and a 36-in. planer in the Chicago territory and also a 48-in. planer to the Ford Motor Co. for shipment to Canada. The Illinois Central Railroad placed an order for two 2700-lb. hammers and three 10-ft. pneumatic flanging clamps. The Pennsylvania Railroad bought two 90-in. horizontal boring and drilling machines. One 800-lb. single frame hammer has been sold to the Dixie Construction Co., Birmingham. An order for radial drills from a Detroit automobile manufacturer has been booked by a local machine tool builder. Both the automotive industry and the railroads are yielding considerable milling machine business. Sales of small tools have been good this month. The used machinery market is fairly active. Manufacturers of lathes state that business has slumped to some extent in the past two weeks. All planer manufacturers are busy. Production of turret lathes is increasing.

South America is furnishing some business. The Chile Exploration Co. has purchased a 5-ft. universal radial drill and a 36-in. planer, while the Argentine Naval Commission has bought a 26-in. lathe. The Illinois Central Railroad has bought against its list, purchases including three No. 4 carwheel lathes, two heavy 90-in. driving wheel lathes, a 48-in. carwheel borer, a 90-in. quartering machine, and a 90-in. locomotive lathe. The Standard Oil Co. of Kansas is the buyer of an 1100-lb. single frame steam hammer. The A. O. Smith Corporation, Milwaukee, has closed for a 42-in. boring mill.

The Dixie Highway Water Co., Coppin Building, Covington, Ky., will take bids until July 13 for the construction of a pumping station and for furnishing and erecting pumping and auxiliary machinery and an elevated steel water tank. Robert L. Crigler is president.

The Meade Pulp & Paper Co., Chillicothe, Ohio, manufacturer of electric supplies, has completed plans for a two-story and basement factory, 60 x 300 ft. Contract for the structural steel has been placed with the McClintic-Marshall Co., Pittsburgh.

The Shawver Co., Springfield, Ohio, manufacturer of automobile supplies, has awarded contract to William F. Morningstar, 15 Arcade Building, Springfield, for a two-story and basement addition, 40 x 40 ft.

The U Drive It Co., Spring and Third Streets, Columbus, Ohio, will take bids at once for a two-story and basement automobile service, repair and garage building, estimated to cost \$60,000. T. W. Newman, 60 North Harris Avenue, is architect. John S. Beeb is president.

The Eureka Tool & Die Co., Dayton, Ohio, has acquired a portion of the plant of the Maxwell Motor Corporation, McDonough Street, for a new works. Plans are also under way for the erection of a two-story building on adjoining property, to cost \$50,000.

The Tennessee Electric Power Co., Hamilton National Bank Building, Chattanooga, Tenn., has acquired the munde-

ipal electric light and power plant at Crossville, Tenn., and the municipal power plant and waterworks at McMinnville, Tenn. Plans are under way for extensions in these districts and the installation of additional equipment.

The Mobile & Ohio Railroad Co., Fullerton Building, St. Louis, has awarded contract to Dwight P. Robinson & Co., Inc., 125 East Forty-sixth Street, New York, engineer and contractor, for the second unit of its car and locomotive shops at Jackson, Tenn., consisting of three machine shops, two 75 x 375 ft. and one 50 x 375 ft.; forge and blacksmith shop, 75 x 78 ft.; boiler shop, 50 x 150 ft.; wheel shop, 50 x 75 ft.; tank shop, 75 x 80 ft., and other structures, estimated to cost \$1,000,000 with equipment.

The Board of Education, Chattanooga, Tenn., plans the installation of manual training equipment in the proposed East Chattanooga junior high school to cost \$350,000, for which bids have been asked on a general contract. R. H. Hunt, James Building, is architect.

The Ohio Edison Co., Springfield, Ohio, will proceed with the erection of a two-story substation and switching plant, to cost about \$240,000 with equipment. H. E. Miller is general superintendent.

The Louisville Hydro-Electric Co., Louisville, has secured permission to proceed with a proposed hydroelectric power development on the Green River in Edmonson County, to cost \$1,500,000 with transmission system.

The Fergs Stamping Co., Bristol, Tenn.-Va., will install equipment in a local building to be given over to the manufacture of oil-testing devices, including power presses, enameling ovens, etc.

## Chicago

CHICAGO, June 22.

**M**ACHINE tool sales thus far in June have been in encouraging volume and by some prominent dealers are described as the heaviest since last December. Railroad buying has been the leading feature of the market, but orders from industrial companies are also more numerous. The Illinois Central has completed purchases against its outstanding inquiries, including the small supplementary list issued late in April. The Santa Fe continues to buy against its extensive list and a complete distribution of orders is expected within the next week or two. The Chicago, Milwaukee & St. Paul has closed for a used motor-driven 26-in. engine lathe and it is said that the rest of its list also will be purchased in second-hand equipment. No definite word has been received as to when the Chicago, Burlington & Quincy will take action on its pending requirements. A large new list is expected to be issued by the Illinois Central to cover its needs at the Paducah, Ky., shops now under construction.

The automobile industry is also an important factor in current buying. The Nash Motors Co. has closed for additional equipment for its Kenosha and Milwaukee plants. Among the machines bought for Kenosha are two turret lathes, and four Barnes single spindle horizontal boring machines. An inquiry for a 36-in. x 36-in. x 8-ft. planer for Kenosha is still pending. For Milwaukee it has closed for a turret lathe, a Rockford horizontal boring machine and a Colburn horizontal boring machine. The A. O. Smith Corporation, Milwaukee, has also been a buyer, having closed for five milling machines, a shaper, an upright drill, and two engine lathes. At Detroit also, buying by the automobile industry has been noteworthy, Dodge Brothers alone having closed for 19 turret lathes. A considerable number of orders from industrial companies consists of one or two machines. The Link Belt Co., Chicago, has placed orders for two 34-in. King boring mills and its subsidiary, the H. W. Caldwell & Son Co., has placed a motor-driven chaser grinder. The All-American Radio Corporation, Chicago, has ordered a 20-in. shaper.

Deere & Co., Moline, Ill., have secured a permit to construct an addition to their foundry at a cost of \$5,000.

The Commercial Parlor Frame Co., 1915 Clybourn Avenue, Chicago, manufacturer of furniture, has awarded a general contract to Gerhardt F. Meyne, 127 North Dearborn Street, for a fourteen-story factory, 50 x 170 ft., to cost \$600,000. Edward H. Nordlie, 4727 North Maplewood Avenue, is architect and engineer.

The Service Motor Co., 1246 Superior Street, Duluth, Minn., will ask bids in July, for a three-story service, repair and garage building, 100 x 140 ft., to cost \$140,000 with equipment. Gillison, Ellingsen & Erickson, Lonsdale Building, are architects.

The City Council, Mankato, Minn., plans the installation of pumping machinery in connection with proposed extensions and improvements in the municipal waterworks estimated to cost \$50,000. L. P. Wolff, Globe Building, St. Paul, Minn., is consulting engineer.

The Gillespie-Dwyer Co., 1712 West Lake Street, Chicago, manufacturer of ventilating equipment, sheet metal products, etc., has leased space in the building at 1916 West Lake Street, where increased production facilities will be provided.

The Iowa Power & Light Co., Des Moines, Iowa, operated by the Des Moines Electric Light Co., is disposing of a bond issue of \$2,000,000, a portion of the proceeds to be used for extensions in power plants and system. It has work in progress on a local steam-operated electric generating station, with initial unit to have a capacity of 25,000 kva. The ultimate plant will have a capacity of 166,200 kva. Clement Studebaker, Jr., is president.

The Maytag Co., Newton, Iowa, manufacturer of electric-operated washing machines, etc., has awarded a general contract to the Lanning Construction Co., Evans Building, for its six-story addition, 100 x 290 ft., estimated to cost \$150,000. The Henry Raeder Co., 20 West Jackson Boulevard, Chicago, is architect.

The Waldorf Paper Products Co., Myrtle and Hampden Avenues, St. Paul, Minn., has plans for a one-story power house, 60 x 100 ft., estimated to cost \$150,000 with equipment. H. A. Sullwold, 107 East Third Street, is architect.

The Central Light & Power Co., Garrison, N. D., plans extensions and improvements in its power house estimated to cost \$25,000.

The Board of Education, Rochester, Minn., has plans for a three-story industrial school, 65 x 245 ft., to cost \$210,000 with equipment. H. H. Crawford, Dental Building, is architect; F. H. Tustison, 430 Oak Grove Street, is engineer.

The Houck Mfg. Co., 912 Hawthorne Avenue, Minneapolis, has been incorporated with \$50,000 capital stock to manufacture appliances used in engineering, specializing for the present in an automatic vacuum vaporizer. It has a plant with limited capacity and may find it necessary to expand later. Martin Houck is president.

The Linwood Cement Co., 713-15 Kahl Building, Davenport, Iowa, has been organized to manufacture Portland cement and crushed stone products. Its plans are still in the formative stage. J. F. Schroeder is secretary-treasurer.

The International Harvester Co., 606 South Michigan Avenue, Chicago, is in the market for a used two-stage air-compressor, with motor drive of 500 to 1000-ft. capacity.

## Milwaukee

MILWAUKEE, June 22.

**I**NCREASING activity among foundries and machine shops is the most encouraging feature of the machine-tool market. There is fairly steady demand, but of only moderate volume, principally in single items for replacement. Shops are making only such improvements in plant or equipment as imperative needs require. Automobile plants are buying sparingly as a rule, the bulk of the business for seasonal production apparently having been booked.

The Maynard Electric Steel Casting Co., Milwaukee, is at work on improvements which will practically double the capacity and involve an investment of \$125,000 or more in buildings and equipment. A Moore electric melting furnace has been contracted for. The main foundry is being lengthened 200 ft., making it 125 x 620 ft. The pattern storage, vault and shop will be enlarged by an addition, 60 x 70 ft., work to begin immediately. Frank Wabiszewski is general manager.

The Wausau Foundry & Machine Co., Wausau, Wis., is a new corporation with \$100,000 capital stock organized by Edward C. Helmke, Henry H. Schneider and Otto Kolbe, all of Wausau, to engage in the general machinery, foundry and repair business. The equipment, machinery and good will of the former Wausau Foundry & Machine Works, which has liquidated its assets, had been acquired. A new gray iron foundry and machine shop will be erected, to be ready about Aug. 15.

The Superior Metal Products Co., Kenosha, Wis., has been incorporated with a capital stock of \$12,000 by Carl and Walter Momm and John Olep, to manufacture metal stampings, principally automotive equipment and accessories. Leases have been taken of manufacturing space and equipment is being purchased.

The Hell Co., Milwaukee, manufacturer of tanks, dump body and hydraulic hoist equipment, will gain considerable floor space for the manufacturing department by erecting



a two-story office building, 40 x 120 ft. The work is in charge of Frank Howend, architect and engineer, 65 Wisconsin Street, local. The additional space will be used largely for fabricating fuel oil storage tanks. Julius P. Heil is vice-president and general manager.

The Beloit Foundry Co., Beloit, Wis., sustained an estimated loss of \$100,000 by fire which destroyed the main building and badly damaged the equipment, on June 9. The pattern shop and pattern storage vault were saved. A new 5-ton electric traveling crane recently installed was destroyed, and many patterns in use, and owned by various machine tool and machinery manufacturers of Beloit, Rockford, Janesville and other nearby points were destroyed. As quickly as adjustments of the loss are completed, ground will be broken for a new foundry and machine shop on the present site. J. A. Janvrin is president and general manager.

The Koehring Corporation, 3100 Concordia Avenue, Milwaukee, manufacturer of concrete mixers, paving outfits, contractors' hoists and other equipment, has engaged Herbst & Kuenzli, architects, 130 Grand Avenue, local, to make plans for a core-room addition, 50 x 75 ft., and some alterations in the present plant to provide more capacity. William J. Koehring is president and general manager.

The Achen Motor Car Co., 155 Oneida Street, Milwaukee, distributor of the Chandler and Cleveland cars, has ordered plans for a new sales and maintenance building, 120 x 148 ft., three and four stories, estimated to cost \$175,000. Dr. F. W. B. Achen is president and general manager.

The Wesley Steel Treating Co., 651 South Pierce Street, Milwaukee, has awarded contracts for the erection of a \$20,000 shop addition, 30 x 75 ft., and is purchasing equipment.

The Horlick's Malted Milk Co., Racine, Wis., will soon be in the market for miscellaneous conveyor, storage and other equipment for a new four-story warehouse building, 120 x 125 ft., contracts for which are now being let. The architect is Louis Lehle, 3810 Broadway, Chicago. The work will cost about \$200,000. William Horlick, Jr., is vice-president.

The Line Materials Co., South Milwaukee, Wis., manufacturer of materials and supplies for electric and telephone transmission lines, has let the general contract to Bentley Brothers, 808 South Pierce Street, Milwaukee, for erecting a three-story addition, 80 x 204 ft.

The Jenkins Machine Co., Sheboygan, Wis., will build a two-story addition, 47 x 150 ft., for manufacturing, storage and office purposes. The present office will be remodeled for manufacturing. Edward A. Juul, Sheboygan, is architect, and the general contractor is the Verhulst Co., Inc., 2221 Calumet Drive, Sheboygan.

The Ormsby Auto Equipment Co., 1116 Wells Street, Milwaukee, will build a \$60,000 addition to its garage, sales and service building. It will be 93 x 200 ft., two stories and part basement.

The prospect Motor Co., 473-477 Prospect Avenue, Milwaukee, has plans for an addition to its sales and service building, two and three stories, with basement, to cost about \$75,000. William R. Schuett is general manager.

The Menominee & Marinette Light & Traction Co., Marinette, Wis., is taking bids through Derrick Hubert, architect, Menominee, Mich., for the construction of an addition, 35 x 90 ft., and remodeling the steam generating plant, at an estimated cost of \$75,000, including some new machinery and other equipment. A. J. Goedjen is general manager.

## New England

Boston, June 22.

**M**ACHINE tool sales reported the past week were small in volume and unimportant. Metal-working shops contemplating the purchase of tools apparently are no nearer placing orders than they were a week ago. New inquiries are also few. The city of Boston will close bids this week on metal-working equipment for the Emily A. Fifield School, Dunbar Avenue, Dorchester district. Few tenders were sent out to the trade on this business.

The High Speed Hammer Co., Rochester, has advanced prices approximately 10 per cent on high-speed hammers.

One of the local machine tool houses has just purchased a large amount of equipment used in a Boston vocational school, which is to be abandoned.

Plans will be ready about July 1 for a two-story, 80 x 231 ft. trade school at Bridgeport, Conn. E. B. Caldwell, Jr., 866 Main Street, is the architect.

Contract has been awarded for the erection of a coal trestle at Concord, N. H., for the New Hampshire State Hospital. J. R. Worcester & Co., 79 Milk Street, Boston, are the engineers.

Bids have closed on a three-story and basement, 50 x 100 ft. machine shop extension for J. L. Thomson, Roberts Street, Waltham, Mass. Arthur F. Gray, 509 Exchange Building, Boston, is the architect.

The James Russell Boiler Works Co., 9 Dewar Street, Dorchester, Boston, is having plans prepared for a one-story addition. Monks & Johnson, 93 Chauncy Street, Boston, are the engineers.

Work is under way on a one-story foundry for the William Krodell Foundry, 1820 Baldwin Street, Waterbury, Conn., for the manufacture of brass, bronze, aluminum, and other castings.

Electric motors and power equipment, conveying and other machinery will be installed in the five-story printing plant, 51 x 380 ft., to be erected by the Travelers' Insurance Co., Hartford, Conn., estimated to cost \$500,000. A general contract has been awarded to Marc Eldlitz & Son, Inc., 41 East Forty-second Street, New York.

The Electric Light & Power Co., Abington and Rockland, Mass., is arranging for a stock issue of \$136,000, a portion of the fund to be used for extensions and improvements.

The Hamelin Machine Co., Lynn, Mass., has leased the former machine works of the Parsons Machine Co., Marlboro, Mass., recently acquired at a public sale by Charles H. Lawrence of the Lawrence-Kelley Machine Co., Boston, and will occupy the plant for the manufacture of parts and metal patterns, operating in conjunction with the Lynn plant, devoted to the production of heavy machine equipment. Orlando Hill will be in charge of the Marlboro works.

The Boston Consolidated Gas Co., Tremont Street, Boston, has plans for a one- and two-story equipment storage and distributing plant, 42 x 120 ft., at Everett, estimated to cost \$30,000.

The Edison Electric Illuminating Co., 39 Boylston Street, Boston, has plans for a one-story automobile service, repair and garage building, 120 x 120 ft., at 1165 Massachusetts Avenue, for company motor trucks and cars, estimated to cost \$50,000, with equipment. Bigelow & Wadsworth, 3 Hamilton Place, are architects.

Swift & Co., Chicago, and 60 North Market Street, Boston, plan the installation of cold storage and refrigerating equipment in their proposed new five-story and basement building to cost \$200,000. Contract for the building superstructure has been let to the John W. Ferguson Co., Paterson, N. J.

The Roubalx Mills, Inc., Clinton, Mass., will erect a one-story machine shop and wood-working plant, to replace a structure destroyed by fire May 21. The foundations will be arranged to provide for a second story later. Machine tools and auxiliary equipment will be installed.

Bids will be received by the Board of Contract and Supply, Hartford, Conn., until June 30, for about 38,500 ft. of wire cable, varying from No. 7 to No. 60. C. DeLancy Alton is secretary.

Fire, June 17, destroyed the pulp wood grinding mill and property of the American Realty Co., Washburn, Me., with loss in excess of \$250,000 including stock. Rebuilding plans are said to be under advisement.

W. W. Drummey, 60 Boylston Street, Boston, architect, has plans for a machine and forge shop, with automobile repair works and garage on Clayton Street, Dorchester, owner's name temporarily withheld, estimated to cost \$45,000, with equipment.

The Hedstrom Union Co., Gardner, Mass., manufacturer of children's vehicles and carriages, is arranging to occupy the plant of the Gardner Chair Co., Main Street, recently purchased, and purposes to increase production. The Gardner Chair Co., will be consolidated with the Concord-Colonial Chair Co., Wayland, Mass., and will remove the machinery to this plant.

## St. Louis

St. Louis, June 22.

**C**ONTRACT has been let by the Missouri Pacific Railroad Co., St. Louis, to the Kellerman Constructing Co., Victoria Building, for a one-story addition to its locomotive repair shop at the Ewing Avenue yards estimated to cost \$65,000.

The Century Electric Co., Nineteenth and Pine Streets, St. Louis, has awarded a number of separate contracts for the erection of its proposed two-story and basement addition, 70 x 75 ft., estimated to cost \$75,000, for which superstructure will soon be placed in progress. L. Pendleton, 119 North Seventh Street, is architect.

The Common Council, Ada, Okla., is planning the installation of pumping machinery in connection with extensions in the municipal waterworks estimated to cost \$300,000. Black & Veatch, Mutual Building, Kansas City, Mo., are engineers.

The Board of Education, 911 Locust Street, St. Louis, plans the installation of manual training equipment in the proposed intermediate high school to be erected at Market, Laclede, Cardinal and Garrison Streets, three-stories and basement, to cost \$900,000, for which bids will soon be asked on a general contract.

The Chicago & Alton Railroad Co., 340 West Harrison Boulevard, Chicago, will proceed with the erection of a new grain elevator at Kansas City, Mo., to cost about \$350,000, with hoisting, conveying, loading and other machinery. R. A. Cook is chief engineer.

The City Council, Columbia, Mo., has plans for extensions in the municipal electric light and power house, with the installation of a turbo-generator and accessory equipment, estimated to cost \$52,000. The Burns & McDonnell Engineering Co., Kansas City, Mo., is consulting engineer.

The Federal Mining & Smelting Co., Joplin, Mo., is considering plans for rebuilding its local mill, with equipment to provide for a capacity of about 40 tons of ore per hr., to cost close to \$100,000 with machinery. W. P. George is one of the heads of the company in charge.

The Hayes Equipment Co., Wichita, Kan., mine and railroad equipment and supplies, with headquarters at Cleveland, has awarded a general contract to Vandenburg & Son, 119 South Lawrence Street, for the erection of a factory branch, one-story and basement, 125 x 150 ft. Paul Hatfield is local manager.

The Buffalo Island Compress Co., Leachville, Ark., recently organized, has acquired a tract of land and plans the erection of a cotton compressing plant to cost \$75,000 with equipment. John Parr and P. S. Osborne head the company.

The City Council, Independence, Mo., will soon begin extensions and improvements in its municipal electric light and power plant to cost close to \$20,000. Black & Veatch, Mutual Building, Kansas City, Mo., are consulting engineers.

A. T. Evans, Leavenworth, Kan., is having plans drawn by Robert W. Watson, Telephone Building, architect, for a one-story machine shop, 50 x 100 ft.

The Common Council, Wakefield, Kan., plans the installation of a pumping plant in connection with proposed extensions and improvements in the municipal waterworks to cost \$45,000. The Burns & McDonnell Engineering Co., Kansas City, Mo., is engineer.

## Pacific Coast

SAN FRANCISCO, June 10.

PLANS are being completed by the Department of Public Service, Bureau of Power and Light, Los Angeles, for a two-story storage and distributing plant, 66 x 300 ft., to cost \$100,000.

The Board of Education, Los Angeles, plans the construction of a one-story manual training shop at its proposed new Mount Vernon junior high school, estimated to cost \$350,000, for which plans are being drawn by J. C. Austin and F. M. Ashley, Chamber of Commerce Building, architects.

The Board of Supervisors, San Francisco, has acquired property at Mariposa and Bryant Streets, as a site for general repair and conditioning shops for the municipal railroad system. Plans will be drawn in the near future.

The Bakersfield Rock & Gravel Co., Bakersfield, Cal., has plans under way for a new plant, estimated to cost \$100,000 with equipment. Fred C. Macomber, Taft, is president.

The Idaho Cement Co., Lewiston, Idaho, has plans for a new mill on the Mission Creek, consisting of several units, with power house and machine shop, estimated to cost \$1,000,000 with machinery.

The Hofus Steel & Equipment Co., L. C. Smith Building, Seattle, has awarded a general contract to the Austin Co., for the first unit of its proposed plant, one-story, 100 x 320 ft., to cost \$35,000. Other buildings will be erected later. Two traveling cranes, 5 and 15-tons, respectively, will be installed.

The Adams Box & Crate Co., Atwater, Cal., plans the erection of a new factory, to cost \$30,000 with equipment.

The Board of Education, Huntington Beach, Cal., has plans under way for a new manual arts building at the local high school, in conjunction with a number of other structures, for which it is expected to ask bids soon.

The City Council, Chandler, Ariz., plans the installation of electrically operated pumping equipment in connection with proposed extensions and improvements in the municipal waterworks. The Weiland Engineering Co., Denver, Colo., is in charge.

The Fruit Growers' Service Co., Wenatchee, Wash., has taken out a permit to erect a one-story cold storage and refrigerating plant, estimated to cost \$32,000.

The Sunbeam Mining & Refining Co., Sumner, Wash., is contemplating the erection of a new one-story plant for the manufacture of paint pigments and kindred products, to cost \$40,000 with equipment.

The Associated Oil Co., 1 West Murray Street, Everett, Wash., will build a new oil storage and distributing plant, to cost close to \$40,000 with equipment.

The Feather River Power Co., San Francisco, has acquired property at Marysville, Cal., for the construction of a power dam and hydroelectric power development, to cost \$100,000 including transmission system.

Construction of a new storage and distribution plant, to cost approximately \$85,000, is contemplated by the Pan-American Petroleum Co., Spring Arcade Building, Los Angeles, on property, 100 x 200 ft., recently acquired.

Work has started on the construction of a cold storage plant for the Union Ice Co., Watsonville, Cal. The Gay Engineering Corporation has the contract at \$175,000.

Plans are being prepared by G. Stanley Wilson, architect, 646 West Ninth Street, Riverside, Cal., for an ice manufacturing and storage plant to be built at Calipatria for the Imperial Ice & Development Co.

Floor space of the Modern Die & Stamping Co., Twelfth and San Pedro Streets, Los Angeles, has been enlarged 200 per cent with the leasing of additional room. The company will purchase new machinery to care for increased business.

## Gulf States

BIRMINGHAM, June 22.

BIDS will be received by the United States Engineer, Florence, Ala., until July 20 for a gantry crane for installation on the spillway section of the Wilson Dam.

The Simms Petroleum Co., operating the Simms Oil Co., Dallas, Tex., has acquired the refinery of the Clayton Oil Refining Co. at West Dallas and has tentative plans for extensions and the installation of equipment. E. T. Moore is president of the Simms Oil Co., which will operate the local unit.

The Common Council, Haines City, Fla., plans the installation of pumping equipment in connection with proposed extensions and improvements in the municipal waterworks to cost \$50,000, in which amount bonds have been voted.

The West Texas Utilities Co., Abilene, Tex., has plans for enlargements in its steam-operated electric generating plant to cost about \$175,000 including additional equipment.

Frank Davis, P. O. Box 1566, New Orleans, is in the market for a wheel lathe.

The Valley Electric & Ice Co., Mission, Tex., is arranging for the erection of a one-story power plant estimated to cost \$65,000 with equipment.

W. M. Smith & Co., First Avenue, Birmingham, have inquiries out for a mushroom type magnet, about 42 in. in diameter, or larger; also for a scrap baling press.

The Polk County Board of Public Instruction, Lake Wales, Fla., plans the installation of manual training equipment in a proposed new high school, to cost \$150,000 for which a general contract will be let during July. M. Leo Elliott, Citizens' Bank Building, Tampa, Fla., is architect. Headquarters of the school board are at Bartow.

The E. J. Morris Ice & Cold Storage Co., Atlanta, Ga., is arranging for a new cold storage and refrigerating plant in the Croissant Park section, Miami, Fla., estimated to cost \$80,000 with equipment.

The City Council, Panhandle, Tex., plans extensions and improvements in its municipal electric power plant, including the installation of additional equipment.

The Florida Rock Products Co., Brooksville, Fla., has tentative plans for the construction of a new mill to manufacture cement products, to cost \$150,000 with equipment.

The Board of Education, Houston, Tex., plans the installation of manual training equipment in its proposed three-story junior high school at Woodhead Street and Westheimer Road, to be known as the Montrose junior high school, estimated to cost \$500,000.

J. D. Wrather, Shamrock, Tex., and associates are completing plans for the construction of a new oil refinery at Lela, Tex., with initial capacity of about 1000 bbl. per day.

The Hill-O'Connor Co., Victoria, Tex., recently organized with a capital of \$90,000, will build a one-story ice-manufacturing plant, 75 x 130 ft., to cost about \$40,000. R. E. Hill is president.

The Crane Co., 836 South Michigan Avenue, Chicago, is considering plans for a new factory and distributing branch at Houston, Tex.

The City Council, Houston, Tex., plans the installation of steam-turbo driven centrifugal pumping equipment and



auxiliary machinery in connection with extensions in the central waterworks. Three 300-hp. water tube boilers and accessories will be installed. J. C. McVea is city engineer.

The Tampa Steel Products Co., Tampa, Fla., care of F. H. Wolfe, president, Tampa Board of Trade, is said to be contemplating the construction of a plant for the manufacture of a line of steel and iron products.

## Indiana

INDIANAPOLIS, June 22.

**B**IDS have been asked by the Dill Foundry Co., Rushville, Ind., for a one-story foundry, 140 x 180 ft., to cost about \$50,000 with equipment. William Dill is general manager.

The Board of Trustees, Purdue University, Lafayette, Ind., will begin the erection of a one-story addition, 51 x 60 ft., to its high tension electrical laboratory, estimated to cost \$90,000 with equipment. Nicol, Scholer & Hoffman, Ross Building, are architects.

The International Cement Corporation, 342 Madison Avenue, New York, has acquired the plant of the Indiana Portland Cement Co. at Greencastle, Ind., with annual capacity of 1,500,000 bbl. The new owner contemplates extensions and betterments. With its other plants in different parts of the country the International company has a combined yearly output of 10,000,000 bbl. of cement. To arrange for the purchase of the Indiana company mill and for further acquisitions and expansion, the company has authorized an increase in capital from \$5,000,000 to \$15,000,000. H. Struckmann is president.

Fire, June 11, destroyed a portion of the plant of the American Veneer & Lumber Co., Roachdale, Ind., with loss reported at \$75,000 including equipment. Plans for rebuilding are under advisement. Ralph Conner is president.

The Union Tank Car Co., 21 East Fortieth Street, New York, has awarded a general contract to the Hughes-Foulkrod Co., Pittsburgh, for its proposed car construction, repair and conditioning plant at Whiting, Ind., consisting of foundry, machine shop, power plant, wheel shop and other structures, estimated to cost \$1,700,000 with machinery.

Isador M. Cohen, 807 Broadway, Gary, Ind., architect, has plans for a four-story automobile service, repair and garage building at Madison Avenue and Eleventh Street to cost \$65,000.

The Service Tool Works, Inc., Indianapolis, has leased property at 413 Massachusetts Avenue and will operate a machine shop.

The Calumet Power Co., Gary, Ind., has plans for the erection of a new steam-operated electric power house at Michigan City, Ind. Sargent & Lundy, 72 West Adams Street, Chicago, are engineers. Charles Chase is vice-president.

Motors, controls, power equipment, conveying and other machinery will be installed in the proposed three-story and basement printing plant to be erected by the Fort Wayne News Sentinel Publishing Co., Fort Wayne, Ind., to cost \$180,000, for which a general contract has been let to the Buesching & Hagerman Co., 402 East Superior Street.

The Victory Products Corporation, Marion, Ind., recently incorporated to manufacture cushion snubs, is having its product made by the Marion Malleable Iron Works, Marion, and is operating to capacity. R. G. Thompson is president.

## Canada

TORONTO, June 22.

**M**ACHINE tool sales and inquiries are showing some improvement. In addition to the steady demand for single tools, small lists are appearing and business as a whole is somewhat brighter than it has been for some time. While the automotive industry is the principal buyer at present there is also a growing demand on new works account and for tools to replace obsolete equipment.

The Superior Machinery Co., 151 York Street, London, Ont., is in the market for a dividing head tailstock for an 18-in. Cincinnati milling machine.

A. Foster, president Goudreau Gold Mines, Ltd., Goudreau, Ont., is asking for a used 24-in x 12-in. Blake jaw crusher, one set 36 x 16-in. rolls, and a 40-hp. motor.

Frank J. D. Barnjum, Annapolis Royal, N. S., announces the erection of a 200-ton paper mill on the Mersey River in Nova Scotia, at a cost of \$5,000,000. It is also understood that a power plant will be constructed to develop about 75,000 hp.

The Canadian Match Co., Pembroke, Ont., has started work on an addition to its factory and will install considerable new machinery.

The Newton Dakin Construction Co., Ltd., 10 Cathcart Street, Montreal, has been awarded general contract for construction of an additional factory at Brockville, Ont., for the Eugene F. Phillips Electric Works, Ltd.

The Backus Brooks Co., Minneapolis, Minn., has started work on repairs to the Norman dam at Kenora, Ont., to cost \$1,500,000. The company will purchase power house equipment.

The peat plant of the Quebec Artificial Coal Co., Garneau Junction, Que., was damaged by fire with a loss to building and machinery of \$40,000.

The plant of the Standard White Lime Co., Waterloo Avenue, Guelph, Ont., was destroyed by fire June 17 with loss estimated at \$40,000. Valuable machinery was destroyed and will have to be replaced.

The American Can Co., Vancouver, B. C., has taken out a permit for the erection of a manufacturing plant which will represent an investment of \$1,500,000 when completed.

## Foreign

**T**HE Finnish Water Power Department, Helsingfors, Finland, is asking bids until Sept. 1 for two overhead traveling cranes, electrically-operated, with lifting capacity of about 75 tons each, as per specifications on file.

The Sinclair Consolidated Oil Corporation, 45 Nassau Street, New York, is said to be planning the construction of a pipe line, with pumping stations and gathering system in the Limon Hacienda district, near Monterey, Mexico, carrying out the project in connection with the Marland Oil Co., Ponca City, Okla., now operating in this district, and whose output will be taken by the Sinclair company. The project is reported to cost more than \$750,000.

The American Chamber of Commerce in France, 32 Rue Talbot, Paris, has received an inquiry (83076) from a company in Paris in the market for American manufactured ball and roller bearings.

The Foreign Trade Bureau, Philadelphia Commercial Museum, Philadelphia, has received the following inquiries: (43676) from Henri Deselle, 28 Rue Paul Bert, Hanol, Tonkin, French Indo-China, desiring to get in touch with American manufacturers of machinery for a proposed canning plant, including can-making machinery, machinery for closing can tops and sealing, can-filling machinery, fruit-slicing machinery, etc., to be addressed until Nov. 30 at 25 Rue des Ripots, Boulogne-sur-Mer, Pas de Calais, France; (43697) from the Malleable Iron Range Co., Beaver Dam, Wis., which has received an inquiry from a foreign customer for a bicycle wood-rim bending machine, standard type of wood rim; (43685) from Alberto Giral, Casanova 156, Barcelona, Spain, desiring to get in touch with American manufacturers of machinery for automatic wrapping of oranges, lemons and similar fruit with paper; (43677) from Manuel M. Peraza y Compania, S. A., 371-77 Calle 13, Bogota, Columbia, desiring to get in touch with American manufacturers of agricultural and industrial machinery; Mr. Peraza is now temporarily located at 123 West Seventy-seventh Street, New York.

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# Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of items the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE, under the general headings of "Iron and Steel Markets" and "Non-Ferrous Metals."

Bars, Shapes and Plates		Per Lb.
<b>Bars:</b>		
Refined iron bars, base price.....	3.24c.	
Swedish charcoal iron bars, base....	7.09c. to 7.25c.	
Soft steel bars, base price.....	3.24c.	
Hoops, base price .....	4.49c.	
Bands, base price.....	3.99c.	
Beams and channels, angles and tees, 3 in. x ¼ in. and larger, base .....	3.34c.	
Channels, angles and tees under 3 in. x ¼ in. base .....	3.24c.	
Steel plates, ¼ in. and heavier.....	3.34c.	
Merchant Steel		Per Lb.
Tire, 1½ x ¼ in. and larger.....	3.30c.	
(Smooth finish, 1 to 2½ x ¼ in. and larger).....	3.65c.	
Toe-calk, ½ x ¾ in. and larger.....	4.20c.	
Cold-rolled strip, soft and quarter hard.....	7.00c.	
Open-hearth spring steel .....	4.50c. to 7.00c.	
<b>Shafting and Screw Stock:</b>		
Rounds and hex.....	3.95c.	
Squares and flats .....	4.45c.	
Standard tool steel, base price.....	15.00c.	
Extra tool steel .....	18.00c.	
Special tool steel .....	23.00c.	
High-speed steel, 18 per cent tungsten.....	70c.	

Sheets		Per Lb.
<b>Blue Annealed</b>		
No. 10 .....	3.89c.	
No. 12 .....	3.94c.	
No. 14 .....	3.99c.	
No. 16 .....	4.09c.	

Box Annealed—Black		Per Lb.
<b>Soft Steel</b>		
C. R. One Pass	Per Lb.	
Nos. 18 to 20.....	3.95c. to 4.00c.	
Nos. 22 and 24.....	4.00c. to 4.25c.	4.75c.
No. 26 .....	4.05c. to 4.30c.	4.80c.
No. 28* .....	4.15c. to 4.40c.	4.90c.
No. 30 .....	4.35c. to 4.60c.	

Galvanized		Per Lb.
No. 14 .....	4.25c. to 4.50c.	
No. 16 .....	4.40c. to 4.65c.	
Nos. 18 and 20 .....	4.55c. to 4.80c.	
Nos. 22 and 24 .....	4.70c. to 4.95c.	
No. 26 .....	4.85c. to 5.10c.	
No. 28* .....	5.15c. to 5.40c.	
No. 30 .....	5.65c. to 5.90c.	

\*No. 28 lighter, 36 in. wide, 20c. higher per 100 lb.

Welded Pipe			
Standard Weld		Wrought Iron	
Black	Galv.	Black	Galv.
½ in. Butt....	46 29	½ in. Butt... 4	+19
¾ in. Butt....	51 37	¾ in. Butt... 11	+ 9
1-3 in. Butt....	53 39	1-1½ in. Butt. 14	+ 6
2½-6 in. Lap..	48 35	2-in. Lap. ... 5	+14
7 & 8 in. Lap..	44 17	3-6 in. Lap. 11	+ 6
11 & 12 in. Lap.	37 12	7-12 in. Lap.. 3	+16

Bolts and Screws	
Machine bolts, cut thread, 40 and 10 per cent off list	
Carriage bolts, cut thread, 30 and 10 per cent off list	
Coach screws, 40 and 10 per cent off list	
Wood screws, flat head iron,	
72½, 25, 10 and 5 per cent off list	
Steel Wire	
BASE PRICE* ON NO. 9 GAGE AND COARSER	Per Lb.
Bright, basic .....	4.25c.
Annealed, soft .....	4.50c.
Galvanized, annealed .....	5.15c.
Coppered, basic .....	5.15c.
Tinned, soft Bessemer .....	6.15c.

\*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire	
BASE PRICE	
High brass sheet .....	18½c. to 19½c.
High brass wire .....	18½c. to 19½c.
Brass rods .....	15½c. to 16½c.
Brass tube, brazed.....	26½c. to 27½c.
Brass tube, seamless.....	22½c. to 23½c.
Copper tube, seamless.....	23½c. to 24½c.

Copper Sheets	
Sheet copper, hot rolled, 20½c. to 21½c. per lb. base.	
Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.	

Tin Plates			
Bright Tin	Grade	Grade	Coke—14 x 20
	"AAA"	"A"	Prime Seconds
	Charcoal	Charcoal	80 lb... \$6.15 \$5.90
	14x20	14x20	90 lb... 6.30 6.05
	IC.. \$11.25	\$8.85	100 lb... 6.45 6.20
	IX.. 12.85	10.85	IC.. 6.65 6.40
	IXX.. 14.40	12.55	IX 7.85 7.60
	IXXX.. 15.75	13.85	IXX.. 9.00 8.75
	IXXXX.. 17.00	15.05	IXXXX..10.35 10.10
			IXXXX..11.35 11.10

Terne Plates	
8 lb. coating, 14 x 20	
100 lb. ....	\$7.00 to \$8.00
IC .....	7.25 to 8.25
IX .....	8.25 to 8.75
Fire door stock.....	9.00 to 10.00

Tin	
Straits, pig .....	60c.
Bar .....	62c. to 65c.

Copper	
Lake ingot.....	16½c.
Electrolytic .....	16½c.
Casting .....	16 c.

Spelter and Sheet Zinc	
Western spelter .....	9½c.
Sheet zinc, No. 9 base, casks.....	12½c. open 13c.

Lead and Solder*	
American pig lead .....	10c. to 12½c.
Bar lead .....	13c.
Solder, ½ and ½ guaranteed.....	39½c.
No. 1 solder .....	36½c.
Refined solder .....	30c.

\*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal	
Best grade, per lb.....	75c. to 90c.
Commercial grade, per lb. ....	35c. to 50c.
Grade D, per lb. ....	25c. to 35c.

Antimony	
Asiatic .....	20c. to 21c.

Aluminum	
No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.....	38c.

**Old Metals**  
The market is quiet and business has slowed down. Dealers' buying prices are as follows:

	Cents Per Lb.
Copper, heavy crucible .....	11.50
Copper, heavy wire.....	11.00
Copper, light bottoms .....	9.25
Brass, heavy .....	6.75
Brass, light .....	5.75
Heavy machine composition .....	8.75
No. 1 yellow brass turnings.....	8.00
No. 1 red brass or composition turnings.....	8.00
Lead, heavy .....	7.50
Lead, tea .....	6.00
Zinc .....	4.25
Cast aluminum .....	17.00
Sheet aluminum .....	17.00



